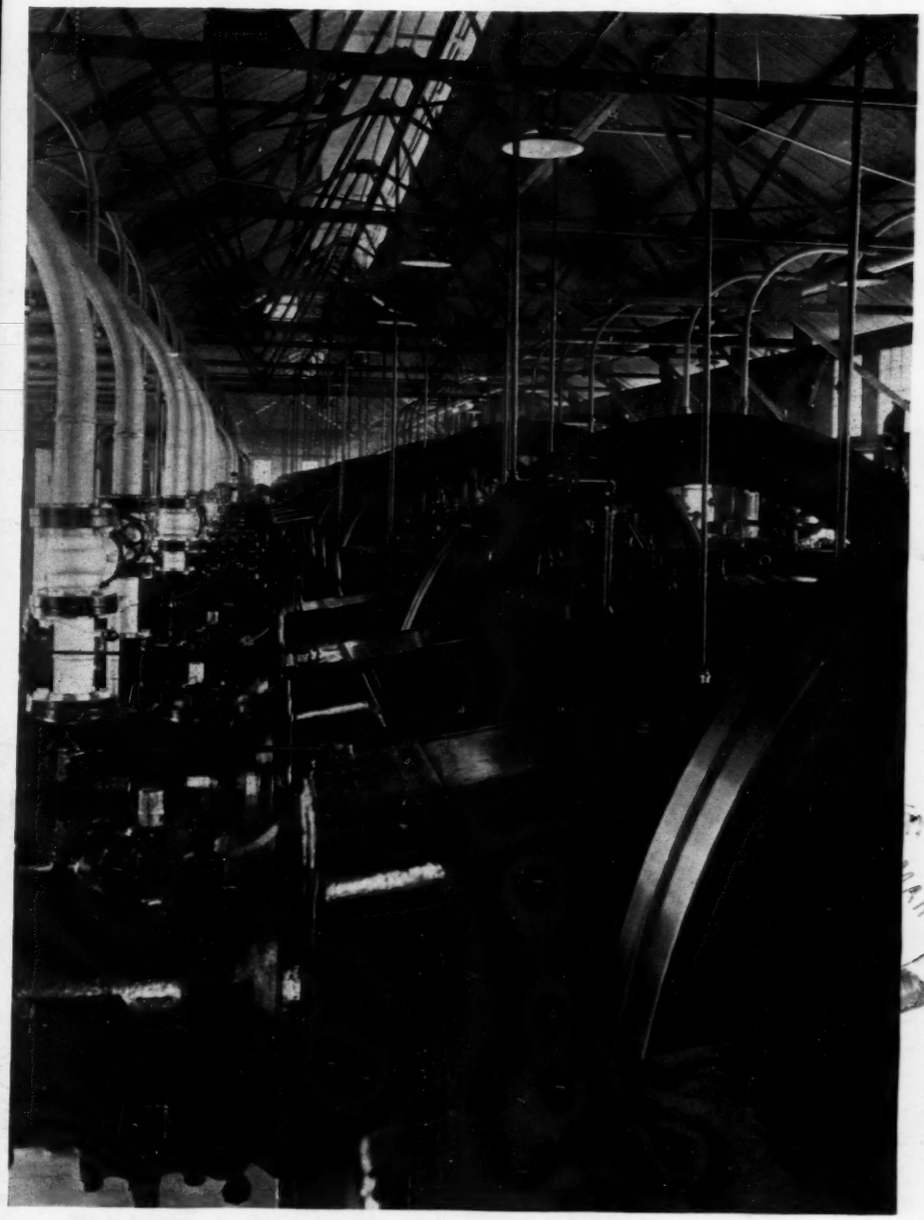
WESTERN GAS

March
1927

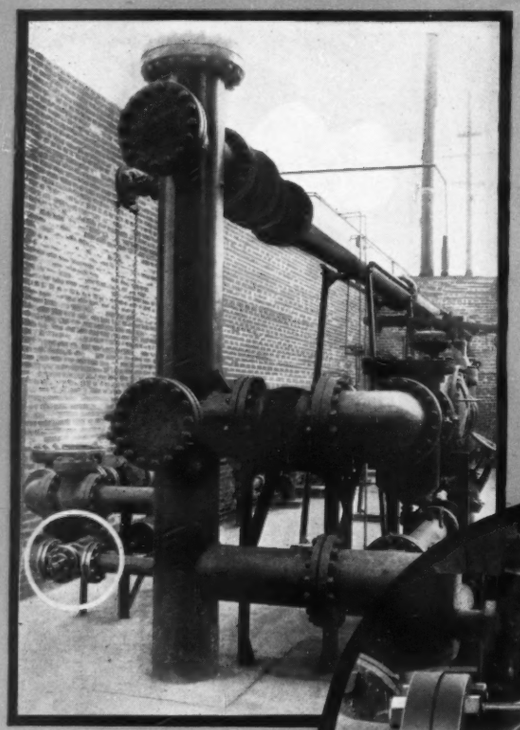


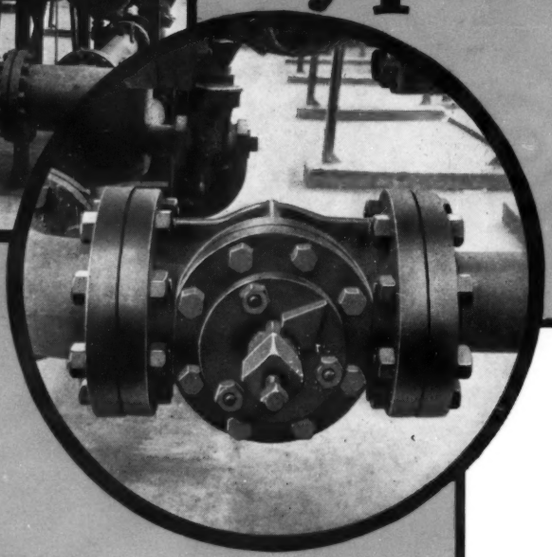
Thirty-two compressor units make up this largest of Western gas transmission plants, which operates at Ventura, Calif., on the Southern Counties Gas Company's line to Los Angeles

20 Cents
the Copy

A MONTHLY JOURNAL DEVOTED TO THE
WESTERN GAS & APPLIANCE INDUSTRIES

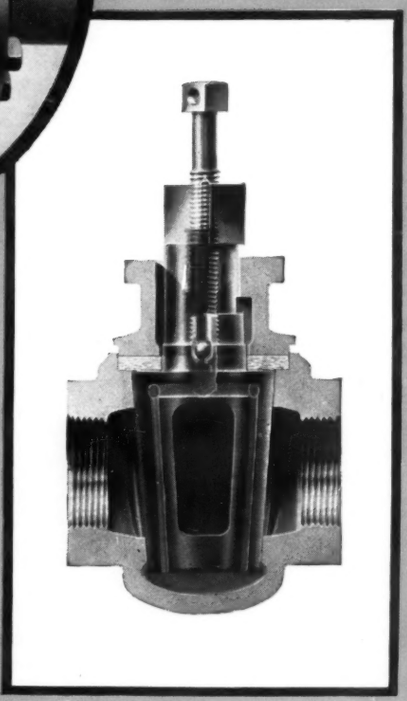
The better valve for By-pass Lines





MERCO

Above illustration shows Merco Nordstrom Plug Valve on by-pass to regulator valves. A close-up view of same is shown in the center.



Won't Stick
Won't Leak

In Merco Nordstrom Plug Valves positive lubrication eliminates sticking. A slight turn of a screw forces lubricant under pressure through a hole in the plug, down through two grooves to a chamber beneath, causing the plug to be raised.. Highly recommended for governor pits, by-pass lines, fire control or service lines, curb cocks, gas and steam lines, tar and ammonia lines, spray and acid lines, cooling coils, collection and distribution lines—in fact wherever dependable valves are required. Request catalog.

MERCO NORDSTROM VALVE COMPANY

SUBSIDIARY OF THE MERRILL COMPANY

Engineers— MERCO *Manufacturers*

San Francisco
121 Second Street
New York Chicago
110 W. 40th St. Peoples Gas Bld.
Western Factory—Oakland, Calif.

Houston
1315 Petroleum Bldg.
New Orleans—Masonic Tem. Bldg.
Cleveland — 325 Engineers Bldg.
Eastern Factory—Belleville, N. J.

Merco Nordstrom
PLUG VALVES

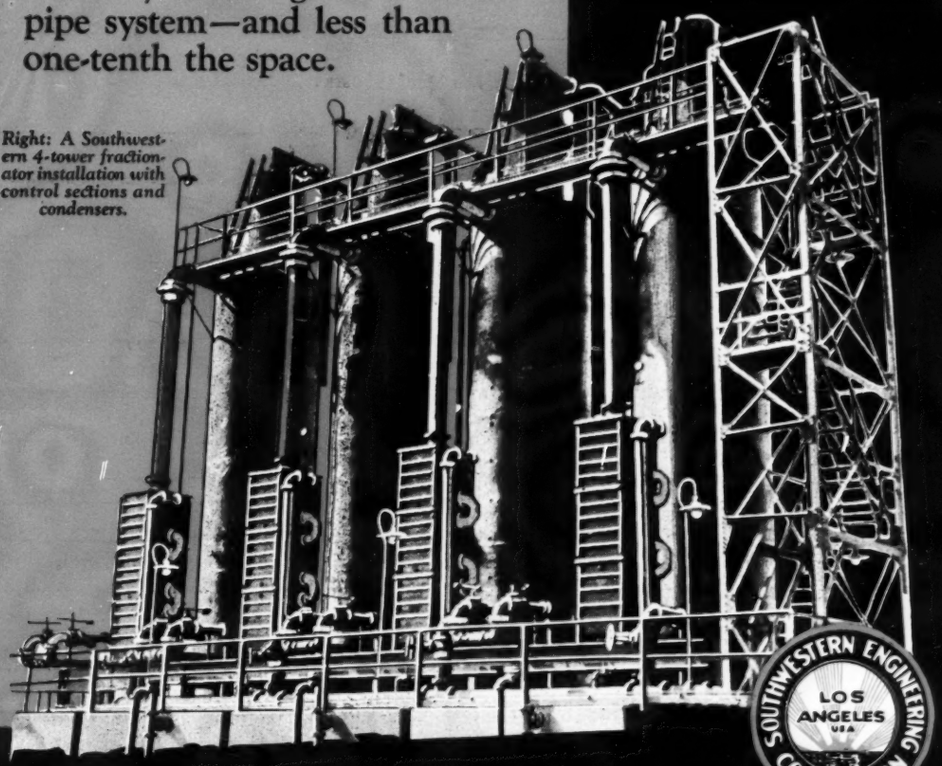
SOUTHWESTERN

CONDENSING SYSTEMS

(PATENTED)

The typical Southwestern Condensing System requires 80% to 90% less cooling surface than the ordinary submerged or double pipe system—and less than one-tenth the space.

Right: A Southwestern 4-tower fractionator installation with control sections and condensers.



SOUTHWESTERN ENGINEERING CORPORATION LOS ANGELES U.S.A.

SOUTHWESTERN ENGINEERING CORP.

1221 HOLLINGSWORTH BLDG.

Los Angeles, Calif.

Offices
TULSA
AMARILLO, TEXAS
NEW YORK

Factories
CULVER CITY, CAL.
TULSA

WESTERN GAS

626 S. Spring Street,
Phone TUcker 8982
Los Angeles, Calif.

447 Sutter Street
Phone GArfield 5383
San Francisco, Calif.

Official Publication Of The
Pacific Coast Gas Association

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BRAUN

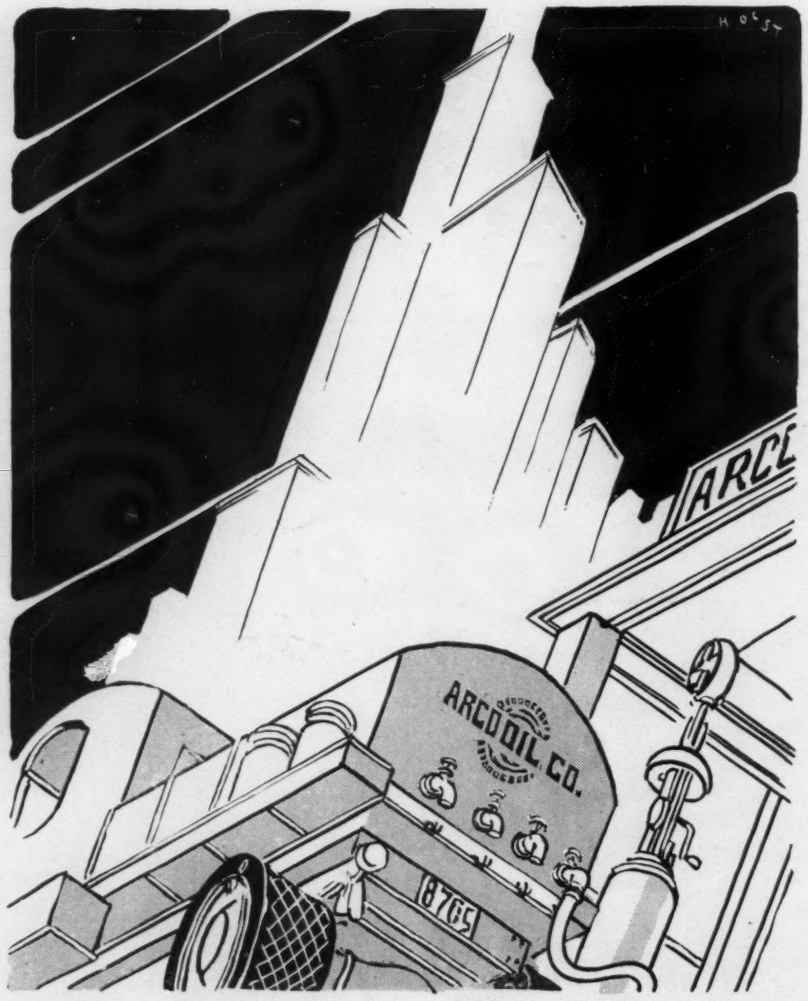
This is a battery of BRAUN Gas Coolers installed in one of the artificial gas plants of a large Pacific Coast Company. BRAUN equipment is giving efficient and satisfactory service in many public utility plants.

C. F. BRAUN & CO.

Manufacturing Mechanical Engineers

Alhambra, Calif.

New York **Tulsa** **Dallas**



Speaking of truck and passenger car tires—

—there must be a reason why GOODYEARS and TRUCK TIRE SERVICE are so popular with the local gas industry. Undoubtedly the high quality of GOODYEAR TIRES is one outstanding reason. Another can be found in the convenience and efficiency of TRUCK TIRE SERVICE.

"The old joke says you can't fool a horsefly. Likewise you can't fool these gas companies. They're so used to givin' service they know the real article when they see it. That's why they come to us." Yours, HI DRAULIC.

"A Tire for Every Need"

Truck Tire Service Co.

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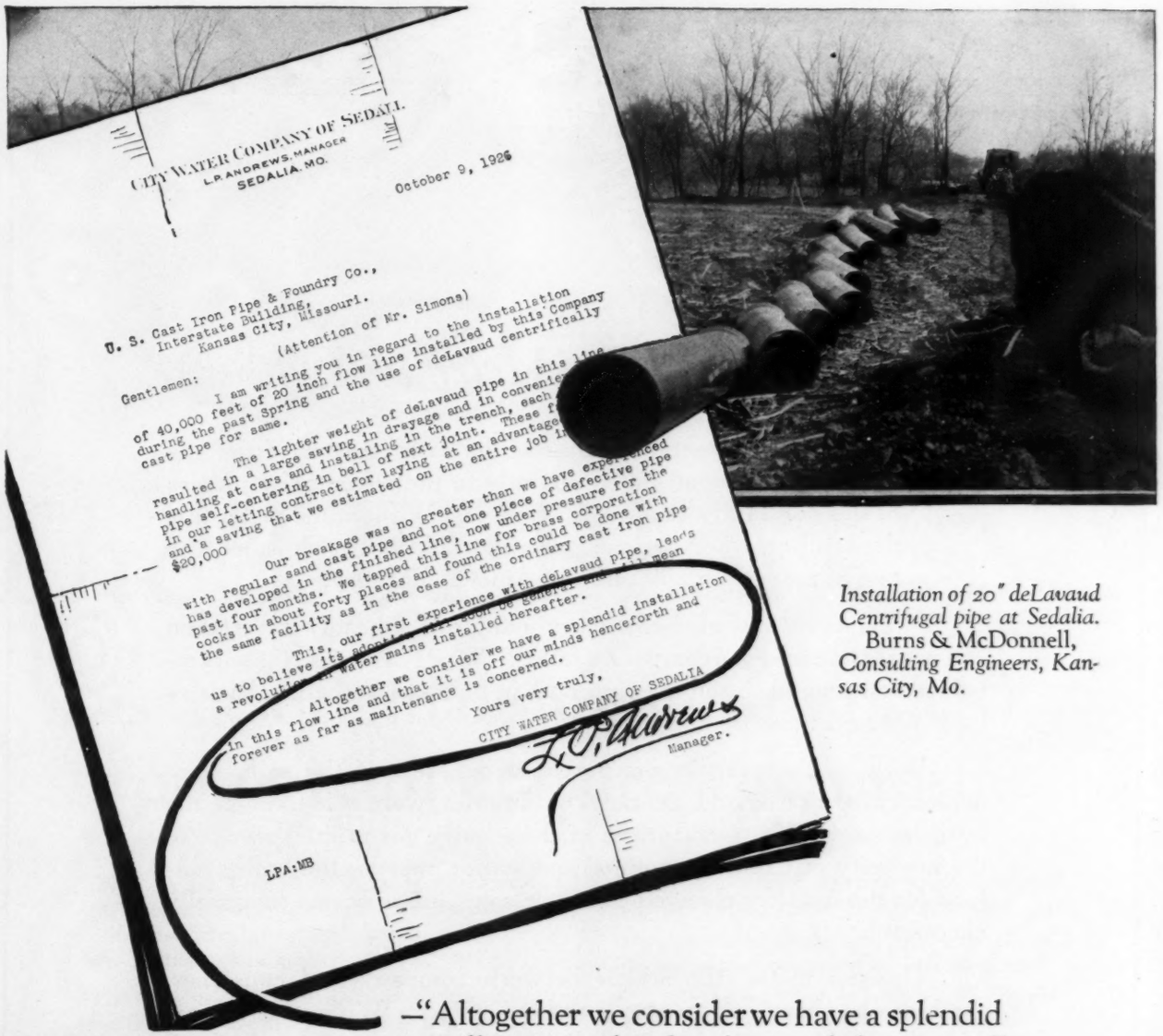
Telephone HO-5524

LONG BEACH
220-East Anaheim
Telephone-62279

1244-East 8th Street — MEtropolitan 6391
LOS ANGELES CALIFORNIA



CITY WATER COMPANY OF SEDALIA
L. P. ANDREWS, MANAGER
SEDALIA, MO.

October 9, 1926

U. S. Cast Iron Pipe & Foundry Co.,
Interstate Building,
Kansas City, Missouri.

(Attention of Mr. Simons)

Gentlemen:

I am writing you in regard to the installation of 40,000 feet of 20 inch flow line installed by this Company during the past Spring and the use of deLavaud centrifically cast pipe for same.

The lighter weight of deLavaud pipe in this line resulted in a large saving in drayage and in convenie... handling at cars and installing in the trench, each pipe self-centering in bell of next joint. These f... in our letting contract for laying at an advantage... and a saving that we estimated on the entire job i...

Our breakage was no greater than we have experienced with regular sand cast pipe and not one piece of defective pipe has developed in the finished line, now under pressure for the past four months. We tapped this line for brass corporation cocks in about forty places and found this could be done with the same facility as in the case of the ordinary cast iron pipe

This, our first experience with deLavaud pipe, leads us to believe its adoption will soon be general and will mean a revolution... water mains installed hereafter.

Altogether we consider we have a splendid installation in this flow line and that it is off our minds henceforth and forever as far as maintenance is concerned.

Yours very truly,

CITY WATER COMPANY OF SEDALIA

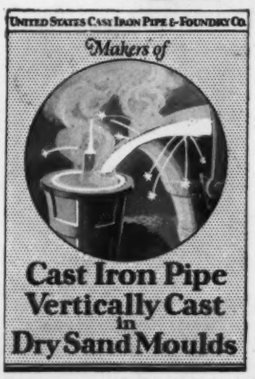
L. P. Andrews
Manager.

LPA:MB

Installation of 20" deLavaud Centrifugal pipe at Sedalia.
Burns & McDonnell,
Consulting Engineers, Kansas City, Mo.

—"Altogether we consider we have a splendid installation in this flow line and that it is off our minds henceforth and forever as far as maintenance is concerned."

Write for special literature covering specifications, uses and manufacture of deLavaud Centrifugal pipe.



United States Cast Iron Pipe and Foundry Company

SALES OFFICES

Philadelphia: 1421 Chestnut St.
Chicago: 122 So. Michigan Blvd.
Birmingham: 1st Ave. & 20th St.
Buffalo: 957 East Ferry Street
Cleveland: 1150 East 26th Street
New York: 71 Broadway
San Francisco: 3rd & Market Sts.
Pittsburgh: 6th & Smithfield Sts.
Dallas: Akard & Commerce Sts.
Kansas City: 13th & Locust Sts
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General Offices:
Burlington, New Jersey

Importance of Gas Meter to Industry

THE METER, sometimes termed "the cash register of the gas industry," has contributed mightily to the commercial success of this constantly expanding business. Without the meter it is doubtful whether the gas industry could have withstood the test of more than 100 years of American history.

In the early days of the industry many of the hastily-undertaken and poorly financed gas companies failed. Why? Because these companies endeavored to sell their product in bulk, on an hourly basis or by haphazard measurement.

With no accuracy in gas measurement, few of the early companies, either in England, Scotland or America, were able to make the business pay. When executives of those early gas utilities awoke to the necessity of using consumers' and station meters, the entire outlook for the industry changed and their companies became financially successful.

The gas meter, the arbiter between company and consumer, therefore has been our insurance against failure. Without it the gas industry could not have prospered. With it the growth of the business has reached a state far beyond the dreams of Murdock, Clegg or Glover.

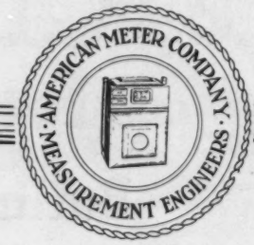
Pacfic Meter Works

of the
American Meter Company, Inc.
Northwestern Representative

SAN FRANCISCO
495 Eleventh St.

PORTLAND
Northwestern Gas and Electric Equipment Co.

LOS ANGELES
2118 Atlantic St.



Write for prices and complete information on this TEEPLE *Thermostat*

The TEEPLE

is the original simple, low priced, room temperature thermostat

Over 10,000 TEEPLE room temperature thermostats are in use on the Pacific Coast. Simple in design, they combine accuracy and permanent reliability

The large number of installations made during the past few years is the best proof of the widespread demand for the TEEPLE thermostat, and its popularity with home and building owners.

Quantity production has brought the price of TEEPLE controls down to a point where sales are largely a matter of suggestion.

We also manufacture magnetic gas valves and complete equipment for the automatic control of gas, steam, hot water, air, oil, or electric heating systems or for refrigeration control.

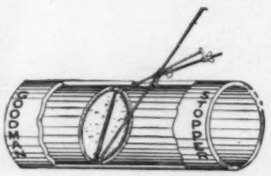
Write us concerning your temperature control problems—we design and manufacture special equipment.

L. R. TEEPLE COMPANY [*formerly* TEPCO *Mfg. Co.*]
540 East 9th Street , , , , Portland, Oregon

TEEPLE TEMPERATURE Controls

Pacific Coast Distributors for Honeywell Heating Specialties Co

GOODMAN *IMPROVED* SAFETY GAS MAIN STOPPER



The genuine Goodman Stopper is instantly recognized by the name Goodman which appears on the Improved Patented Locking Sleeve. All genuine Goodman Stoppers are now equipped with this sleeve. Efficient as the Goodman Stopper has always been, the new locking sleeve makes the shut-off still more effective and positive. Stopper cannot slip—gas cannot pass.

All sizes 3 inches to 48 inches in stock. Special sizes on short notice.

SAFETY SERVICE PLUGS

Type "A"

Expansion Plug which fits into the bottom of the service tee and is quickly expanded by turning the wing nut which securely shuts off all gas. Sizes ¾" to 4"..

Type "B"

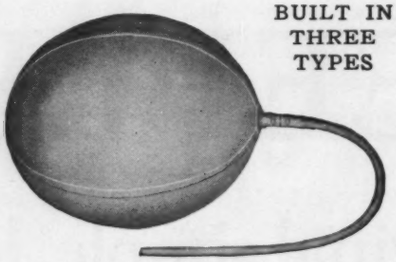
One piece Rubber Plug, taper shaped. Can be quickly applied to service tee. Fits wedge like and prevents gas escaping. Sizes ¾" to 4".

AIR LINE MASK

With or Without Blower

Dependable Gas Main Bags

BUILT IN THREE TYPES



Type A—Invisible Seams or Seamless Bag.

Type B—Reinforced Seams—heavier and stronger than Type A.

Type C—Canvas Covered Bags for use in mains coated with tar or oil.

When ordering specify type desired.

All Goods Sent on Approval

SOAP TAPE

A convenience to have on hand when searching for leaks in mains or services.

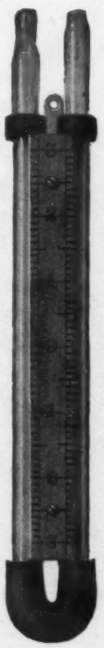
Strips 2", 4", 6" and 8" wide each, 40 ft. in length. Put up in sealed containers. Sample sent on request.

EXPANSION PLUGS FOR GAS MAINS

Fits inside diameter of pipe. Long shank reaches inside past the hub. Can be used in either hub or spigot ends. Standard sizes to 16".

"U" GAUGES

Portable Pressure Gauge for Distribution Men, Complaint Men, or around the Works.



SAFETY GAS MAIN STOPPER CO.

Pacific Coast Representative: C. B. BABCOCK CO., San Francisco

Cable Address: GASTOPPER, N. Y.

523 Atlantic Ave. **Brooklyn, N. Y.**

We doubled our production and cut drying costs in half

By using a certain fuel for drying one of our products it eliminates the services of three attendants, wipes out the maintenance on a steam boiler and saves floor space. We are now producing twice as much of this product and paying one-half the former cost of drying it. The fuel responsible for this saving is gas.

That is what the Sherwin-Williams Company, manufacturers of paints and varnishes that "cover the earth," are doing in their Oakland plant.

P G and E engineers will serve you

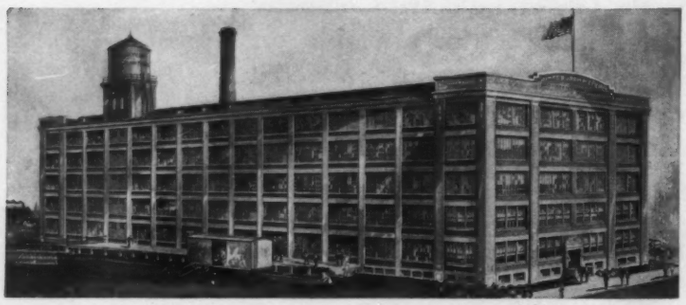
The same engineering service that helped the above manufacturers is also yours for the asking. Just phone or write to the nearest Pacific Gas and Electric Company office. The engineers have information available on industrial heating operations which have been conducted successfully for many years. This service is at your command without cost or obligation on your part.

ANNOUNCEMENT

Equitable Meter & Mfg. Co., announces a change in name to Pittsburgh Equitable Meter Co., coincident with the purchase of all assets of the Pittsburgh Meter Company.

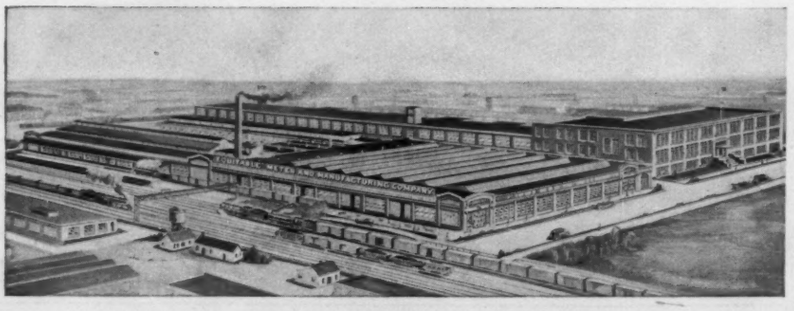
The Pittsburgh Equitable Meter Company will continue the manufacture of of water meters, gas meters, regulators and other products which each of these companies has developed through more than a generation of successful business experience.

PITTSBURGH EQUITABLE METER CO.
PITTSBURGH, PA.



PITTSBURGH
DIVISION

EQUITABLE
DIVISION



MUELLER Iron Body Brass Plug Gas Service Stop As shown or with lock wing.

Since 1857 Mueller Co. has been manufacturing brass goods of recognized dependability. Write for special catalog of Mueller products for gas companies.

Will they withstand Installation Strains?

An important question in the case of iron body stops! If they are Muellers, the answer lies in Mueller construction. Mueller Iron Body Brass Plug Stops are especially designed to overcome installation strains.

These stops have extra heavy walls made of the best grey iron obtainable. The castings are free from sand holes. Core work, moulding and machining are just as accurate as in the case of brass body stops. Keys and washers are made of Mueller red brass. The keys are ground and polished in, and the grinding is superior because two metals of different density grind to a more perfect bearing surface.

Mueller Iron Body Stops are wdely used by an increasing number of gas companies throughout the country because these stops can be installed without any question of their satisfactory service.

MUELLER CO.
(Established 1857)

San Francisco: 1072-76 Howard St. 2468 Hunter St., Los Angeles
Factories: Decatur, Illinois; Port Huron, Michigan
Canadian Factory: MUELLER, Limited, Sarnia

MUELLER

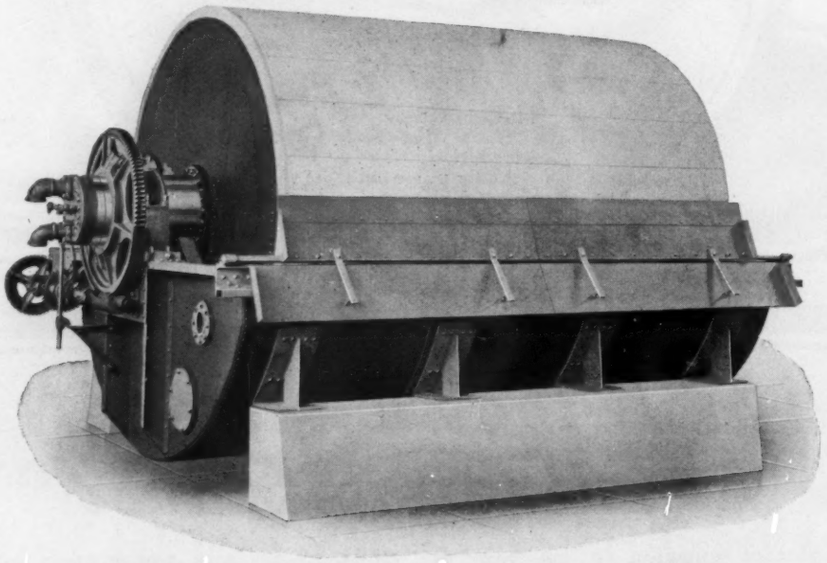
Dependable Gas Fittings

LAMPBLACK

Whether it is to be briquetted
or burned in the boiler-room

Lampblack Dewatering

is a problem in every Oil-Gas Plant



Oliver-Borden Thickners and Oliver Filters

have solved the question for the
Pacific Gas & Electric Company
Los Angeles Gas & Electric Company
Portland Gas & Coke Company
Central Arizona Light & Power Company
New Bedford Gas & Edison Light Company

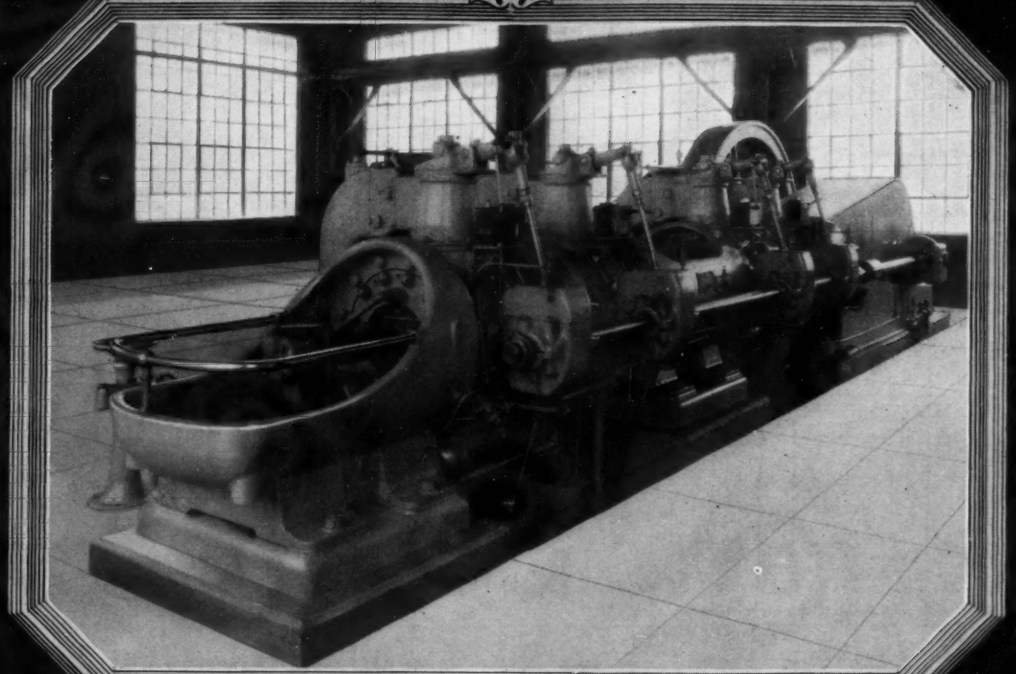
Oliver Continuous Filter Co.

SAN FRANCISCO
503 Market Street

NEW YORK
33 West 42nd Street

LONDON
11 Southampton Row

JOHANNESBURG, SOUTH AFRICA
E. L. Bateman, The Corner House



A Cooper type 19, 380 B.H.P. gas engine has recently been installed by Barnsdall Oil Company near Beggs, Oklahoma. The electric power is used for pumping oil wells.

Barnsdall electrifies oil fields with Cooper Power

In the great struggle to produce oil at a profit from fields that require pumping, electric power is proving both cheap and practical when generated with gas engines. Cooper engines because of their dependability and low cost operation, are being used for this service. We will gladly give you the estimated cost of such a power plant and the total cost of electric power when generated with Cooper gas engines.

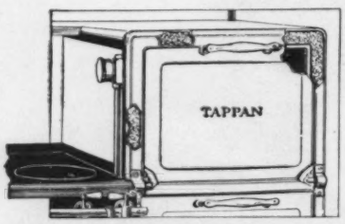
The C. & G. Cooper Company, Mt. Vernon, Ohio

649 South Olive Street, Los Angeles

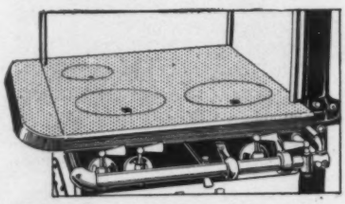
1605 Kirby Bldg., Dallas **604 Kennedy Bldg., Tulsa**

5 Definite Advantages of the Tappan Insulated Oven—

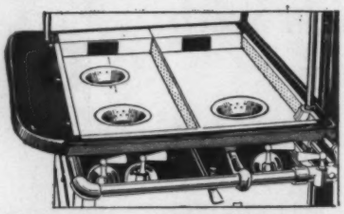
and every one a strong selling point!



The TAPPAN oven is insulated with 25 lbs. of mineral wool, yet it is completely ventilated. The heat is kept in the oven; your kitchen is always comfortable, and half the gas is saved.



The TAPPAN solid top is made of oil-tempered, satin-finished cast iron. It will not stain or discolor, and is easy to keep clean.



The bowl burners under the TAPPAN solid top are scientifically designed for most efficient, labor-saving cooking. The combustion chamber greatly increases the heat-efficiency of the fuel. It saves gas.

1. **Saves fuel.**
2. **Bakes better.**
3. **Makes baking-control easier.**
4. **Holds the heat in the oven.**
5. **Keeps the Kitchen comfortable.**

Just as an oil filter, an air cleaner, four-wheel brakes, and so on, are advantages which make an automobile more desirable in a man's eyes, so the improvements brought about by the TAPPAN Insulated Oven gas range make it more desirable to a woman. Especially since the TAPPAN costs no more.

TAPPAN INSULATED OVEN GAS RANGE

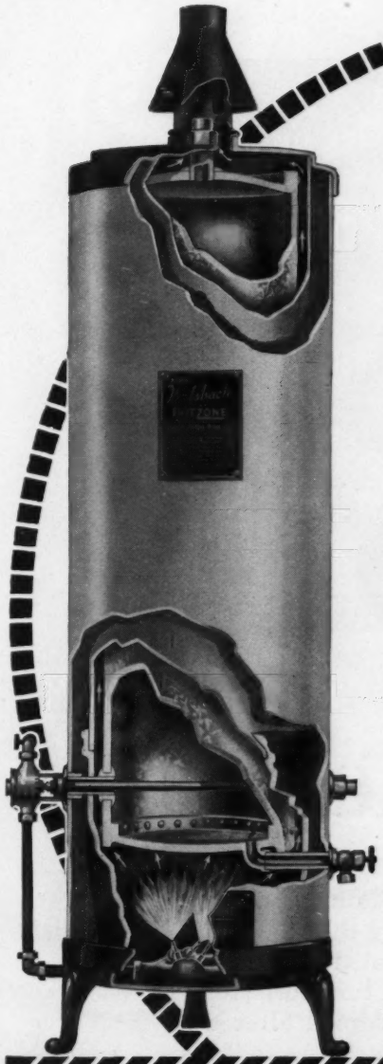
TAPPAN STOVE COMPANY

Pacific Coast Office
665 Howard Street—San Francisco

H. R. BASFORD COMPANY
Direct Factory Representatives
Northern California—Nevada—Hawaii
665 Howard St.—San Francisco

H. R. MAYER
Direct Factory Representative
Southern California—Arizona
1001 East First St.—Los Angeles

Welsbach



Lower in Price Greater in Proven Value

Thousands of users are proving the HOTZONE a dependable, economical water heater. It has always been exceptional value. Now, with NEW LOWER PRICES, you have an opportunity to sell more water heaters than ever.

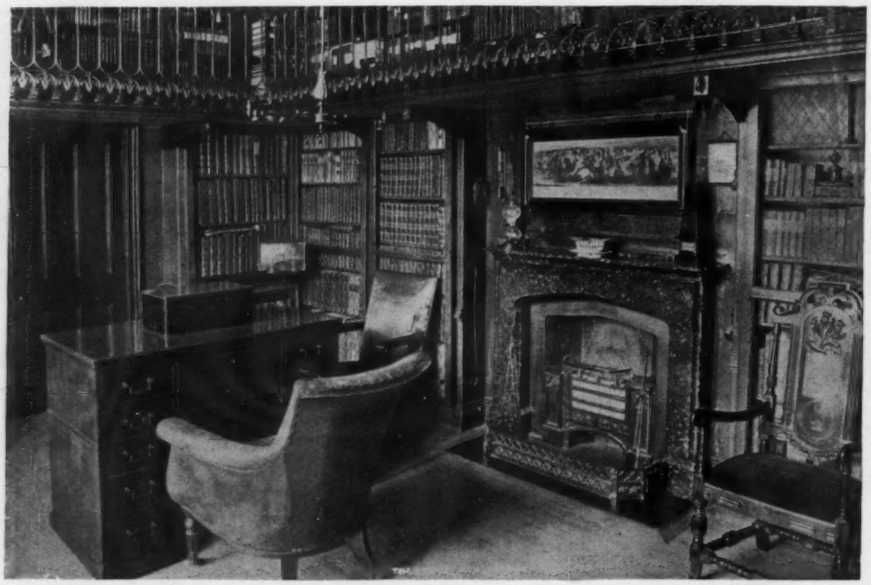
WELSBACH COMPANY
GLOUCESTER, N. J.

San Francisco Office: 863-865 Mission Street

Branches in Principal Cities

Member American Gas Association *Member Natural Gas Association*

HOTZONE
Automatic
STORAGE GAS WATER HEATERS



The study of Sir Walter Scott, Abbotsford, Scotland

The Old and the New

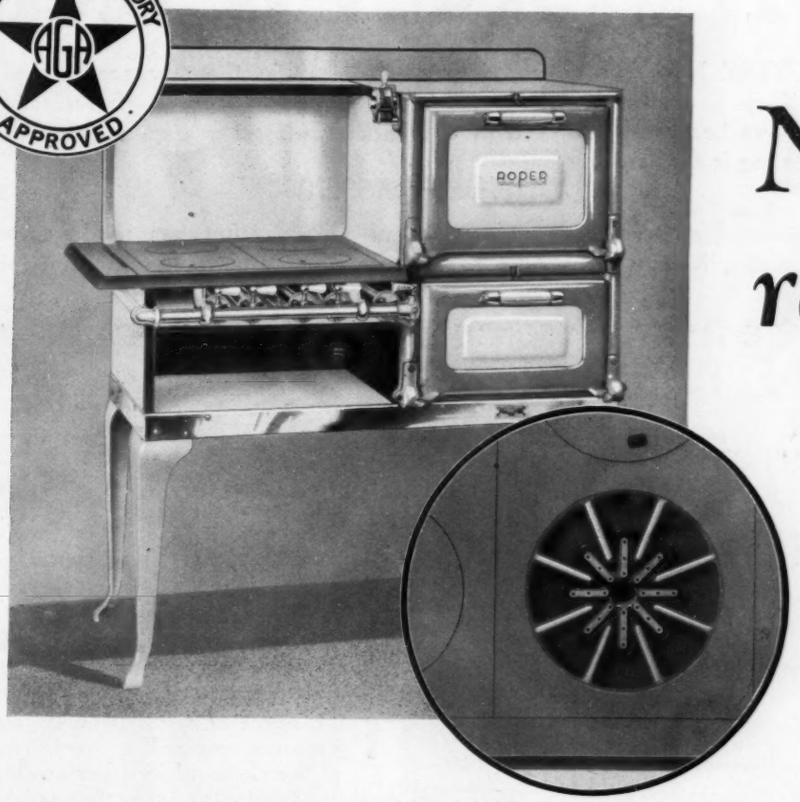
LOOK through the pages of any of many magazines whose subject matter centers about Homes (such as House Beautiful, House and Garden, and so on), and you will quickly perceive that the trend of today is to furnish the home with things carrying out the spirit and the artistry of older times . . . . Stroll through any good furniture store, and you will see displayed all about you, furniture copied after the inimitable designs of famed old craftsmen of all countries . . . . . Go through a well furnished home, and you will see its occupants living with that furniture. "Old stuff"? Certainly—old and beautiful and truly artistic.

In the Humphrey Radiantfire line are many period designs which faithfully carry out the spirit of the best craftsmanship of many lands, of many ages. To these models in the Humphrey Radiantfire line home owners take instant fancy. Typical among the examples from which the Radiantfire designs were conceived is this old fire basket, found in the study of Sir Walter Scott, at Abbottsford, Scotland.

The HUMPHREY
Radiantfire
REGISTERED TRADE MARK

Manufactured by
General Gas Light Company
Kalamazoo, Mich.

Pacific Coast Representative
C. B. Babcock
135 Bluxome Street, San Francisco



Now ready!

Portion of "SafeTop" Cooking top. Lid removed—showing star shaped top burner and grate. Permits placing cooking vessel directly over flame. Each finger of grate spaced evenly between and above fingers of burner, eliminating possibility of flame striking grate. Venturi throat construction. Scientific design assures perfect combustion and safety.

The ROPER "SafeTop" Series

—a new gas range triumph that means big retail sales

You'll boost your past spring sales records to new high levels with this new Roper "Safe Top" Series. Here are selling features never before found in any group of gas ranges.

They are full-size, four burner cabinet ranges with full-size, correct-height cooking top. Cast iron Distributor Plate under cooking top distributes secondary air to each burner in proper quantity and location—also distributes heat for entire top.

Four efficient star burners beneath Distributor Plate. Snug, easily removed lid fits over each top burner — flush with cooking top. With lid removed, cooking vessel may be placed on grate directly over flame.

All Roper "SafeTop" Ranges have rust-proof, removable porcelain enamel oven linings, gray Flexo broiler pans, white porcelain burner trays and "Touch-a-button" top lighter. Ovens heated by loop type burners.

Get these attractive sales blazers on your floor for spring selling. They've got the "Come in" appeal. And the prices assure values unparalleled in gas range history. Send for more facts.

ROPER
TRADE MARK
GAS RANGES
GAS FURNACES

GEO. D. ROPER CORPORATION,
Rockford, Ill.
Pacific Coast Branch:
135 Bluxome St.,
San Francisco, Calif.

BE SURE THE ROPER PURPLE LINE AND THE ROPER COMPLETE OVEN CONTROL ARE ON THE RANGE YOU SELL

POTTER Heating

For many years POTTER Engineers have pioneered the way in the advancement of modern Gas Heating Systems. They have developed Gas Heating to such a degree of perfection that today, POTTER Products have become a standard of comparison wherever dependable, safe, economical and healthful gas heating is discussed.

OUR BEST ASSET

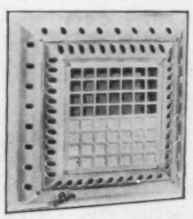
The tens of thousands of satisfied customers that our Organization has made through POTTER Gas Heating installations, is a JUST tribute to a satisfactory product—a gratification to conscientious effort.

THERE ARE MANY REASONS WHY IT IS BETTER TO INSTALL POTTER SYSTEMS

"POTTER" Vented Radiators

Only POTTER has these 7 POTTER Features (Cast Iron and Steel-Made)

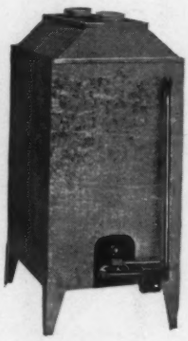
1. Condensation abolished. This does away with corrosion. Many years are added to the life of the Radiator.
2. Triple Circulation. The heat goes into the room, not up the flue.
3. Uniform warmth distribution. The air is never "cooked."
4. Quick heat. No other radiator heats so quickly as the light, efficient POTTER Steel-Made.
5. Aristocratic appearance. The POTTER Cast Iron Radiator is selected for the finest and largest homes.
6. Totally odorless always.
7. Not expensive.



"COLE" Floor and Wall Heaters

Made in heavy solid cast aluminum.

COLE is the only furnace manufactured that can be installed on either the first or second floor.



"MAGIC WAY" FURNACES

"MAGIC WAY" was the first, and has always been considered the leading Unit System of heating.

The principle of Unit Heating of modern buildings, brought to its present state of refinement through the study and efforts of this Organization, is based on the principle of an individual furnace or heater for each room or group of rooms to be heated.

This type of installation allows accurate temperature control in each room, regardless of the demand in other sections of the home.

POTTER quantity production now makes "MAGIC WAY" with electric controls, available to anyone who desires a gas furnace system.

The same features that make these well known POTTER-made appliances favorites with home builders and home owners, make them popular with churches, schools, theatres, auditoriums and factories.

The low cost of adequate heating by means of "MAGIC WAY" Vented Furnaces of either the Unit or Central Plant type, will be a revelation.

"MAGIC WAY" VALVES

By merely pressing a button, the temperature of any room may be regulated. This valve not only turns the heat on but it regulates the heat to suit your exact wants.

"MAGIC WAY" Floor Furnace

When the furnace type of heat is desired at low cost or when a basement is not available, use "Magic Way" Vented Floor Furnaces.

Potter Heating Includes:

"MAGIC WAY" UNIT FURNACES
"POTTER" GAS RADIATORS
"STEEL-MADE" GAS RADIATORS
"COLE" FLOOR AND WALL FURNACES

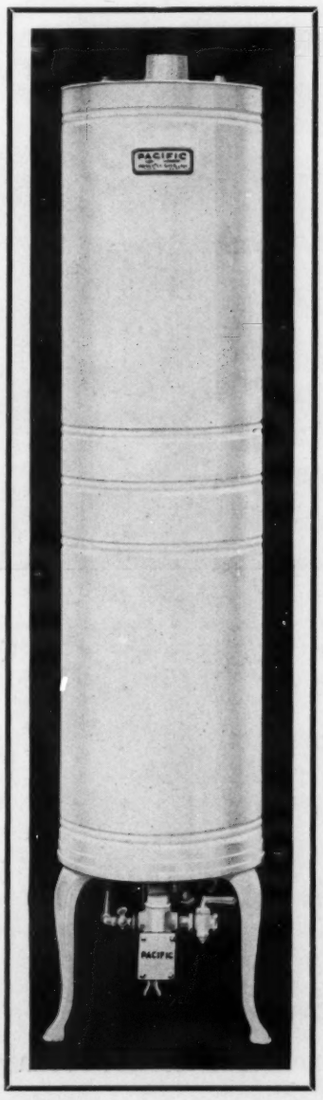
There Is a **POTTER System** for Every Need

POTTER RADIATOR CORPORATION

San Francisco—Oakland—Los Angeles—San Diego

Announcing

A complete line of Automatic Storage & Instantaneous Hot Water Heaters



—manufactured and guaranteed by the largest gas heating appliance manufacturers in the West!

IN the past these heaters have made good in thousands of installations. Now, the Pacific organization has added improvements that make every heater in the line an outstanding value in quality and efficiency.

This complete, strongly-backed line will prove a money-maker for some live dealers. Write or wire for information and details explaining superior features of these heaters. Reserve your territory while it is still open!

Pacific Gas Radiator
Gas Heating **Company** *Headquarters*

Manufacturers and wholesalers to Heating Appliance Dealers throughout the West. Factory at Roseberry and Walter Sts., Huntington Park, Calif. Los Angeles Retail salesrooms—Pacific Gas Heating Co., 1740 W. Washington St., Los Angeles; Phone BEacon 2190

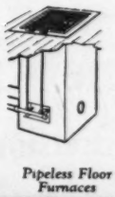
Gas-Steam Radiators

Dual Pipeless Furnaces

Wall and Fireplace Heaters

All Vented for Healthful Heat

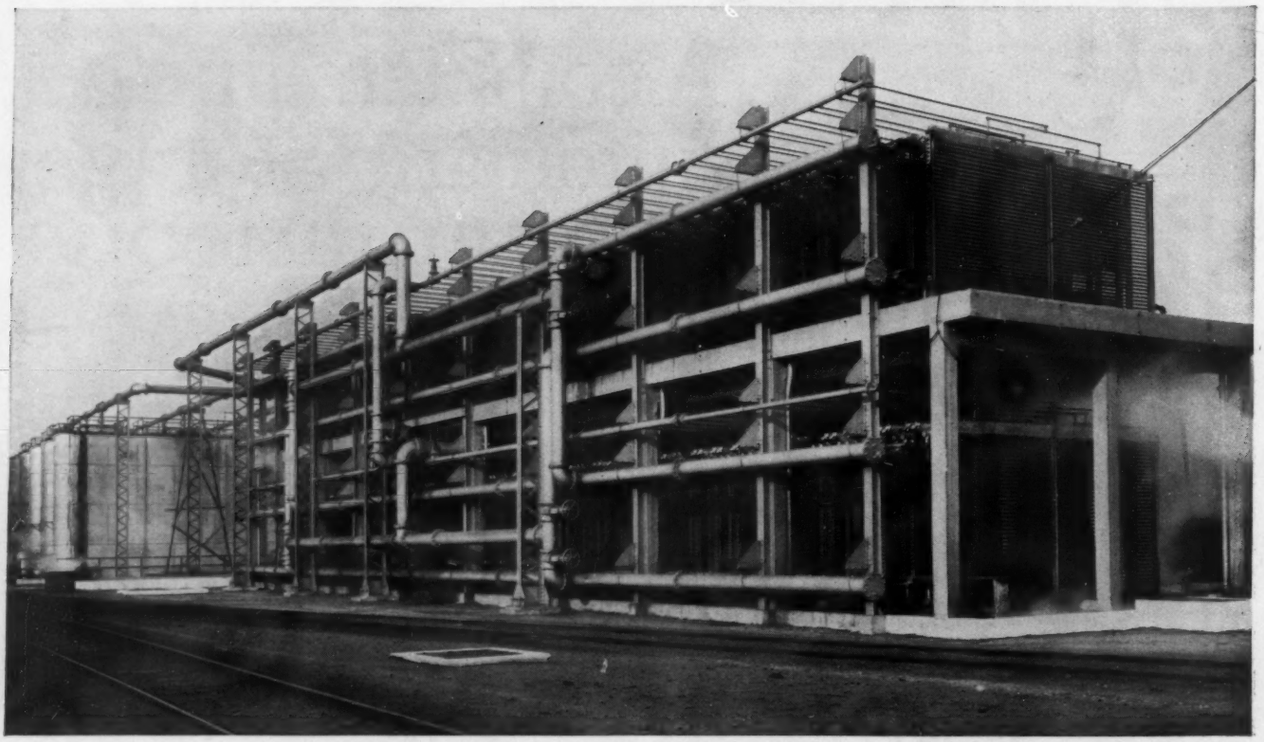
Gas Radiators—Pressed Metal and Cast Iron


Pipeless Floor Furnaces

Unit Basement Furnace Systems

Manufacturers of Every Type of Gas Heating Appliance

Steere Cooling Coils



Are now so extensively used because—

They are built for any and every operating condition.

The highest possible thermal efficiencies are attained.

They are built like a high pressure boiler—any tube can be easily replaced if accidentally damaged or, if broken by freezing, can be easily repaired.

In appearance, they are a good, clean cut, mechanical job.

There is a Steere Cooling Coil built especially for sea water.

No other coil will give as much cooling per dollar invested.

Our Electro-Sherardizing plant operates under an exclusive license from the General Electric Company.

Semet-Solvay Engineering Corporation

Division of Allied Chemical and Dye Corporation

40 Rector Street, New York, N. Y.

WESTERN GAS

A Monthly Journal of the Gas, Gas Appliance and Natural Gasoline Industries in *Western America*

Refrigeration *by* Gas--What Are We Going *to* Do About It?

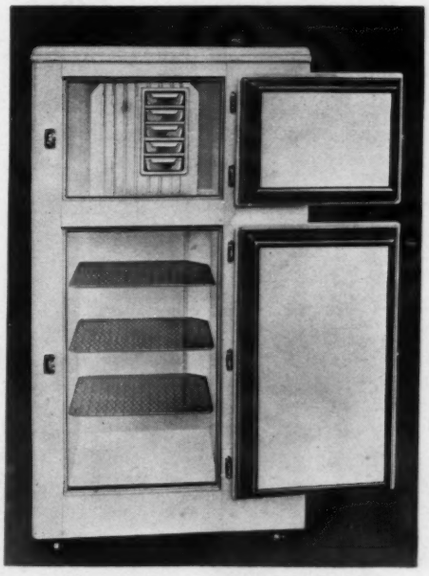
BY D. J. YOUNG

Electrolux-Servel Corporation

¶ At the general sessions of the Pacific Coast Gas Association's February regional meeting at Los Angeles, the following paper was read by A. L. Spring of the Electrolux-Servel Corp. Mr. Young, who was stormbound in the Northwest, telegraphed the paper in time for its presentation. A discussion of gas refrigeration merchandising, and a description of the cycle of operation of the Servel machine, followed the reading of Mr. Young's paper, and a summary is given at the end of the article beginning on this page.

A PRESENTATION of the subject "Refrigeration by Gas" to a group of live gas men offers considerable difficulty. Although much has been presented on the matter, it is likely that some confusion exists as to the real facts and present condition. First, from the technical side, refrigeration by gas is accomplished by what is known as the absorption process. Simply stated, this is a method whereby a certain material, for instance water, is used to absorb the gas produced by the evaporation of another material, for instance ammonia. As you know, the evaporation of any liquid absorbs heat, thereby producing refrigeration. Gas is used as a means for driving the refrigerant out of the absorber, and producing pressure conditions that will allow it to be condensed and led to the point where evaporation or refrigeration is desired. In principle it is very simple and in the early days of manufacture of ice was quite generally used.

The application of the principle to household and automatic equipment has offered many difficulties, not the least of which has been control mechanism and mechanical difficulties. The obvious method of producing this result has been by means of apparatus consisting of a generator and absorber combined, and an evaporator with control device so that at certain times heat may be applied to the generator driving off the refrigerant in gaseous form and producing pressure. This is then cooled, condensed and led to the evaporator. After a certain time a definite amount of refrigerant is thus transferred, the heat is turned off, a cooling agent applied to the generator and the refrigerant is thus allowed to evaporate, returning as a gas to the generator where it is absorbed.



Showing cabinet construction of Electrolux-Servel gas-fired refrigerator. Shell is of pressed steel, lead-coated. Box is insulated with three inches of cork board, and is full porcelain lined. Food capacity of this unit is six and one-half cubic feet.

Such a device is cyclic, has certain periods (heating periods) when no refrigeration is accomplished, and necessitates the intermittent operation of certain valves and other mechanism. Suffice it to say that there is now on the market more than one such device and more in immediate prospect. Some of these have most ingeniously accomplished the desired results with a minimum of mechanical parts, of rugged construction and reliable operation.

There is one other device that is really a marvel of ingenuity which has been able to accomplish the desired result with a complete absence of mechanical or moving parts, and at the same time, produce continuous refrigeration.

SERVICE IS THE BIG FACTOR

After all, the technical end of this discussion is of little importance at this time. Technically, refrigeration by gas can be easily and economically accomplished with reliable equipment. The only question really involved from a technical or mechanical viewpoint is this: "How strong and reliable is the equipment of a dealer in one of the best and ice to keep it in operation?" I think it will be rather interesting just here to cite a few examples of service. I obtained records from the service department of a dealer in one of the best and most popular medium priced automobiles. His records indicate that every automobile must be serviced or is worked on by an expert man once to every twenty-four hours of operation. That is, if you ran a car continuously at thirty miles per hour it would have to go to

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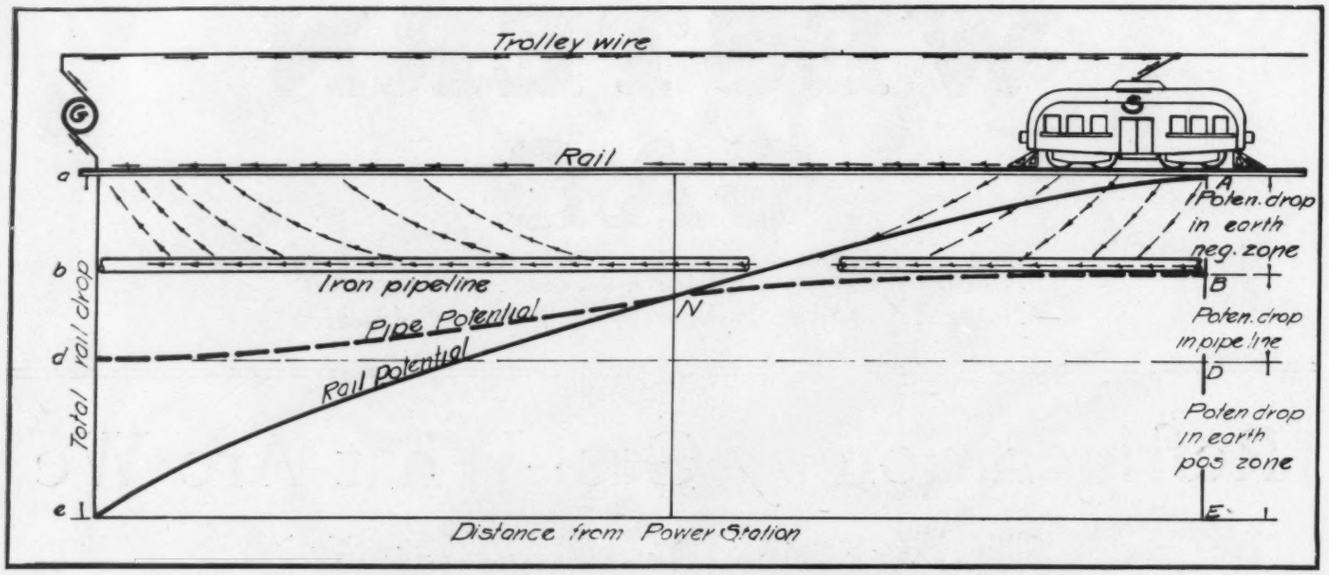

Fig. 1. Illustrating distribution of potential

Surface Protection *as* Applied *to the* Underground Pipe System

By B. A. WILLIAMSON
Electrolysis Engineer, Los Angeles Gas and Electric Corporation

IF SELF-PRESERVATION is the first law of Nature, it begins at the surface. Surface protection is seen in the bark of the tree and in the skin of the animal. Its need in the mineral kingdom is not so great as in the vegetable and animal, for the reason that metals are securely locked within everlasting ores, until needed by man. This natural protection of mineral wealth is lost, however, when ores are reduced, in the production of metals. In the case of iron, it tends to revert to its more stable oxides, having no surface protection provided, except in a limited degree by the coat of rust and in the film of gas that form on the surface, reducing the initial rates of corrosion in the processes of oxidation and electrolysis. Surface protection occurs in the buoyancy of ice, which helps to make the earth habitable by preventing the streams and lakes from freezing and remaining solid.

Without surface protection modern civilization could not long endure. The arts of canning, painting, insulating, lubricating and paving are different forms of it used in preserving food, buildings, machinery, and roads. Machinery rusts out quicker than it wears out, because we know our oil better than our paint. No one would let a valuable machine run without proper lubrication, to which subject much thought has been given. It is just as important that the same effort be given to insure metallic structures against corrosion, especially underground pipe systems, which are subject to no other forms of decay.

CONFUSING CLAIMS

Most research engineers believe that under ordinary conditions of quality and usage, surface treatments are worthless, if not positively injurious, in electrolysis protection of pipes installed in positive zones near electrc railway substations; and worth less than cost in the negative areas, due to extraneous factors. This does not quite coincide with the claim of the manufacturers of these products that they will, if judiciously used, reduce both electrolytic and soil corrosions. This contrariety of opinion, which is one of viewpoint, needs to be ironed out to avoid confusion to the pipe engineer. The efficiency, limitations, and correct usage of pipe coverings cannot be fully understood without due consideration being given to the underlying principles, which may be clearly presented in a simple diagram.

TRACK AND PIPE POTENTIALS

In Fig. 1, G is a generator, whose positive terminal is connected to the trolley wire, which supplies a number of cars with current, S being at the track end. The greater part of this current returns to the negative bus by the rails, and the remainder through the leakage path of earth and underground pipe systems. There will be a potential drop in terms of volts per thousand feet of track that may be represented at any point by the slope of the curve (ANe) where horizontal and vertical distances are taken to represent feet and voltages along the track, respectively. The total loss of voltage (AE) in the track is called its over-all potential drop. This is greater than the over-all potential pipe drop (BD) by the sum of the two potential drops, (AB) and (DE), in the earth, the former being to the pipes and the latter from the pipes. These potential curves pass through zero and reverse values in the neutral zone at N, where there is but little leakage and therefore no great need for pipe covering, except for soil protection. The intensity of leakage to the pipe, and therefore, the need of insulation, increases from point N to the end of the track, where the leakage (i) in amperes per foot may be expressed by Ohms law.

$$i = \frac{AE}{r_1 + r_2 + r_3} \qquad (1)$$

where (AE) is the impressed voltage and r_1, r_2, and r_3 are the resistances of

the leakage path in the soil at the end of the track, in the pipe, and in the earth at the substation, respectively. Since the numerical value of these factors would be different and unknown at all points, the equation is useful for the purposes of analysis of the cause and prevention of electrolysis and not for a basis of calculation.

ELECTROLYSIS MITIGATION

In justice to electric railway engineers it may be stated that they thoroughly understand the problem with a result that track and operating conditions are being steadily improved to the betterment of electrolysis. The factor that has brought about the greatest improvement has been the development of the small automatic substation of low operating cost, which is now being installed to meet new power demands. This may reduce the rail return distance to one-half, and the leakage current to one-quarter, of the former average values. The railways may further lessen the vagrancy by insulating their rails somewhat from the earth through proper road-bed construction and drainage. When the electric railways have gone their temporary limit of mitigative effort, there usually remains considerable electrolysis, which the pipe company must be prepared either to cure or endure.

RESISTING THE ATTACK

Having noted that electrolysis is an attack coming from without that is proportional to the over-all potential rail drop, let consideration now be given to the three lines of defense, more or less vulnerable, that the pipe company may build with the three r's of equation 1. Any stand of opposition against the assault involves some increase or manipulation of these resistances of the leakage path. The paving of the streets will diminish leakage by increasing the resistances r_1 and r_3, through keeping the soil dry. The installation of services and mains at a greater depth and distance works to the same end. Copper connections at the substation, which harmlessly drain off the current to the negative bus, were once hailed as the solution to the problem. They are now, however, generally regarded as temporary expedients, since a smaller resistance r_3 causes a correspondingly larger leakage, with additional corrosion, fire and explosion hazards at other points.

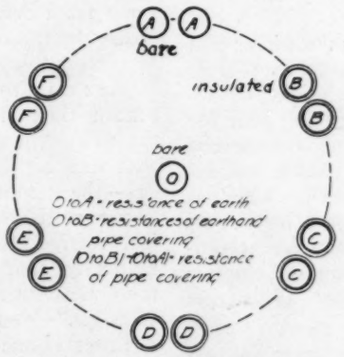

Figure 3. A diagram of a proposed test of comparative values of pipe coverings for soil corrosion

If a new city were to be built to order, electrolysis could be best mitigated by means of high resistance joints at frequent intervals, in all pipe lines, to raise the resistance r_2. In the growth of a city, however, the pipe systems are usually in before the electric railways, which means that their field for attack upon the pipes has been left open at a point where there should be a strong second line of defense. As the city limits are extended it becomes necessary to run trunk lines of large diameter, often of wrought iron or steel pipe, to supply outlying districts. These new transmission lines, when constructed with solid metallic joints, have very low electrical resistances and tend to become main boulevards for the flow of heavy current that is picked up in negative zones and discharged to the soil in positive areas, by the existing network of gas and water mains. This new construction may, in particular cases, largely offset the recent advantage obtained by the use of the automatic substation.

It is believed that the pipe companies should undertake to perfect satisfactory high resistance joints, with an idea of placing them at close intervals in new pipe lines, to restrict current flow. This joint would not leak itself nor cause the pipe to leak. A Dressler coupling might serve, providing the adjacent pipe ends were protected with extra heavy insulation against joint electrolysis. The breakdown of this insulation could be avoided by spacing these joints close enough to assure low potential stresses across them.

SURFACE INSULATION

Pipe coverings restrict the flow of vagrant current by increasing the resistances r_1 and r_3. Since the pipes are attacked at the point of discharge, it has been the practice to insulate them in the positive zones rather than in the larger negative areas, where the cost would be

Fig. 2. Sections from pipe specimens submitted to electrolysis test

greater. This mistake is made under the impression that it is immaterial from an efficiency standpoint whether the resistance is applied to the surfaces of pick-up or of discharge. While it is true the electrolysis will be mitigated to the same degree in amperage and weight, there will be, ordinarily, no reduction in electrolytic depreciation, unless used in the negative zones.

The appalling fact about electrolysis is not so much that it decomposes iron at the theoretical rate of 20½ pounds per ampere-year quantity of electricity, but rather that this loss occurs in small areas, causing rapid penetration at pits, due to the current discharge being concentrated. It is unfortunate that pipe covering, when used on surfaces of discharge, so intensifies this drilling effect that the small current that eventually leaks through is liable to do the same or even greater damage, than would a much heavier but more uniform leakage from the bare pipe. The reason for this may be made clear by reference to equation 1 and Fig. 1.

$$i = \frac{r_1 + r_2 + r_3}{AE}$$

$$AE = ir_1 + ir_2 + ir_3 = AB + BD + DE$$

If r_3 is made great in comparison to r_2 and r_1 by reason of its insulation in the positive zone, then ir_3, or the voltage DE upon the pipe covering, will also be large. In the presence of moisture the pipe covering will, in a course of a few months or years, begin to fail at points of defects or abrasion, permitting a slight current to flow, which will rapidly increase, due to the continued high stress and its disintegrating effect upon the insulation. If, however, the pipe covering is used in the negative

(Continued on Page 50)

Have You Met Miss Home Service?

By ELLA M. LEHR

Director, Home Service
Pacific Gas and Electric Company,
San Jose, California

¶ Those who for one reason or another have *not* "Met Miss Home Service" will learn a number of her outstanding characteristics by reading Miss Lehr's article, which was one of the features presented in the sessions of the Commercial Section of the Pacific Coast Gas Association during the February meeting at Los Angeles.

MAY we introduce to you Miss Home Service—the missionary of the gas works! As yet, she is not so well known here on our Western Coast. Perhaps she's considered too young to be given anything but a baby chair and a doll; perhaps her reputation did not carry West, for everybody knows and loves her in her Eastern home. Yet it may be, we misunderstood her name and introduced her as a Demonstrator instead.

Miss Home Service does not tap on the window at you and balance anemic-looking hot cakes on a weak-backed spatula. She does not dash frantically around with a skillet in one hand and her order book in the other. Nor does she climb upon a soap box and hurl forth silver-tongued declarations on the efficacy of Gas. She could—but—she does not have to!

Instead, Miss Home Service acts as the middleman, if you please—the connecting link between the Gas Company and Mrs. General Public. She takes complaints and misunderstandings and turns them into loyalty and co-operation. She takes your product—"Gas, the fuel of a thousand uses"—and shows it as a means of giving ease and happiness instead of household drudgery. She takes your appliances, and in woman language—sells Beauty—better complexions, softer skins, joy, health, more time off, more freedom for the better things of life—besides "making the world safe for home-cooking."

She interprets her job as a cross between public relations and indirect selling, using as her working motto *"To create more business and a satisfied consumer."*

"But," you say, "That in short is our aim."

MERE MAN HAS HIS LIMITS

Right you are.. Yet—how many baby clothes are sold on the strength of this man-written advertisement—"We have a handsome line of infant's apparel!" How many silk stockings or how much pink lingerie would be sold if makers based their appeal on the number of fibres in the thread or the etymological exposition of the machinery in a silk worm? Who comes in to pay the gas bill? Who complains when the gas water heater springs a leak or the service man tracks mud on the linoleum?

Nearly 95 per cent of the household expenditures are planned in the kitchen —the clearing house for family bills. It is said too that 85 per cent of a man's purchases are made because some woman says yes; and about the only thing he doesn't buy without consulting a woman is cigarettes!

Ella M. Lehr

It's the old tale of the Colonel's lady and Judy O'Grady—and a burned cake is just as effective in bringing them together as the cradle of a suffering baby.

Now, Mr. Gas Man—may I ask you two questions?

1. Where do you stand in the battle of the fuels?

2. Just what do your public relations mean to you?

Today electricity, the mysterious, and oil, the vast, have placed themselves against your product in a mighty struggle for dominance in supplying heat for domestic, industrial, and commercial purposes. Yet it is a battle of appliances rather than of fuels. Gas has been handicapped in the past by lack of up-to-date appliances, but recent improvements and new inventions bid fair to give the gas industry advantages worth capitalizing on.

The biggest potential market for gas lies in the field of domestic appliances.* Although domestic use accounts for 54 per cent of the consumption of manufactured gas in comparison with 21 per cent for illumination, 21.67 per cent for industrial use, and 3.3 per cent unclassified, yet the growth of domestic loads has not kept pace with the population or the wealth, as the following figures show:

Annual increase in total wealth	7.2%
Annual increase in total meters	2.9%
Annual increase in per capita wealth	4.9%
Annual increase in per capita number of gas meters	2 %

Moreover, the sale of electric and oil ranges is increasing faster than the sale of gas ranges—which means that the main selling effort must be put on gas for cooking.**

Yet in these days of ready cooked foods, restaurants with their lure of music, fellowship, good food, and obsequious service from pussyfoot waiters, delicatessens on every other corner, and beauty parlors across the street, all calling "Come out of the kitchen," is it any wonder that the 1907 model gas range rusts away in its dingy corner?

The home is your best chance, for despite jazz, cocktails and careers, American women are not deserting their homes. Love of cooking and home-making will never die.. That is woman —instinct. What she wants is the same sort of efficiency in her home that her husband has in his office or on his farm. Mr. Business Man relegates his 1916 model typewriter to the junk heap; yet that type of range is plenty good enough in his kitchen.

Each year more and more women enter into industry. Clubs, politics, and other activities lead them out of the kitchen. They have less time for cooking, hence restaurants and tea-rooms are growing three times as fast as the normal demands of the population.

CHECK THE AWAY-FROM-HOME DRIFT

Your problem is to check the drift away from domestic cooking and to increase the use of gas in the home, solved by making women appreciate the remarkable up-to-dateness of gas, and replacing their antiquated equipment with the newest in gas appliances;—not only that nice bit of modern life's embroidery—the temperature controlled range —but clothes dryers, ironers, mechanical refrigerators, water heaters, automatically controlled furnaces,—for "if it's done with heat, you can do it better with gas"—you know!

Enter Home Service! She believes in women's activities to the Nth degree, yet she has utmost faith in the home. So she meets with carefully dressed and coiffed club women—preaching the gospel of better and easier cookery. She urges them to leave their home, showing them in a subtle and elusive manner, how by means of absent treatment made possible by the oven control, they are able to serve the family hot appetizing meals right from the oven—and still maintain their outside interests;—incidentally, Mr. Gas Man, using your fuel all afternoon.

She stages cooking schools, classes, and demonstration-lectures, before house-

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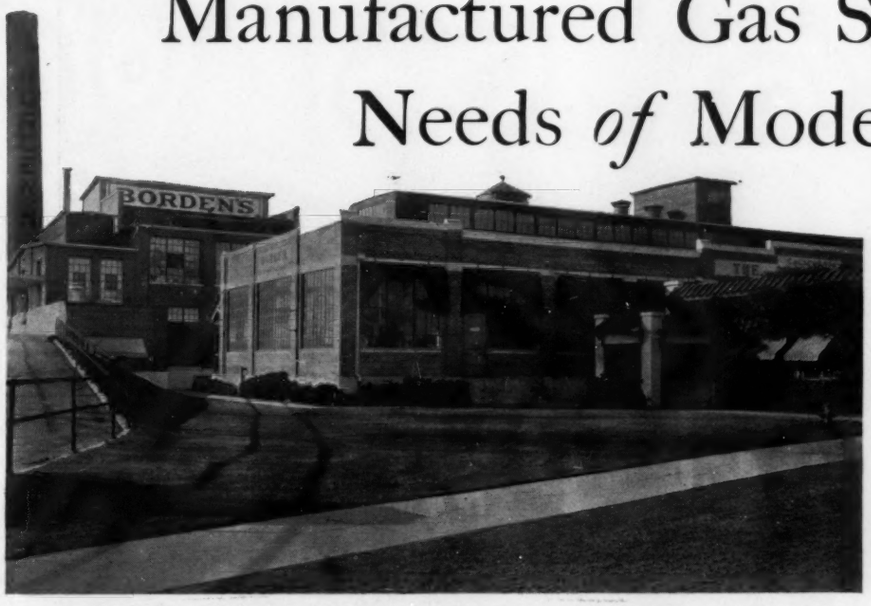
Manufactured Gas Supplies Fuel Needs *of* Modesto Industry

By HARRY MCMANUS

Assistant Manager, Modesto Gas Company



This factory turns out 200,000 milk cans a day. Gas does the heating.

IN line with the increased sale of gas, due to the rapid growth of the city of Modesto, Calif., the Modesto Gas Company has recently added to its lines two industrial gas consumers that will increase the monthly gas sales approximately 700,000 cu. ft.

The first of these plants, the Borden Milk Company, started using city gas for industrial purposes October 4th, 1926, and shows a minimum consumption of approximately 10,000 cu. ft. per day. This business was secured after much survey work was done, showing the inefficiency of their gasoline gas plant, due to flare backs, improper burning and residue, which had to be drained from the lines daily, which showed, after a four days' test, a loss from residual gasoline amounting to over 5 per cent.

With the use of low pressure city gas it was necessary for us to run a 4-inch line to the can factory where, with the use of a Kemp Gas Mixing Machine, the mixture is brought to the proper proportions, which makes it possible to use the same burners that were in use with gasoline gas.

At this time the factory has two can machines, capable of turning out approximately 200,000 milk cans per day of 8 hours. The milk cans manufactured are of three sizes—15-oz., 16-oz., and 6-oz. The cans manufactured by the Borden Company have both ends and side seam soldered. It might be interesting to know that from the time the sheet tin is started in the can machine until the time the can is filled with milk a period of ten minutes elapses.

With the increase in the Borden Company's business, it will be necessary within the next few months, for them to install an additional can machine, which will increase their daily gas consumption approximately 5,000 cu. ft.

The Borden Company is more than pleased with the city gas installation, again proving that gas *is* more dependable, faster heating, easier to control and cleaner than competitive fuels.

DRIED FRUIT CO. TURNS TO GAS

In addition to the Borden Company, the Liberty Dried Fruit Company business was secured after having been pioneered by the Pacific Gas & Electric Company, in San Francisco, where the Liberty Dried Fruit Company was in business before coming to Modesto.

The fruit processing apparatus consists of a 600-gallon tank heated with two Surface Combustion Company's EM-75 Immersion heaters.

This apparatus is used for the processing of prunes and figs and the operation consists of feeding the fruit to an endless conveyor, which travels through the boiling water at a speed that keeps the fruit submerged approximately three minutes. The fruit, after leaving the boiling water, travels over a hardwood tray through a chute to the first floor, where it is boxed, ready for shipment.

This apparatus was dismantled in San Francisco and again erected by the Modesto Gas Company in a new building built for the Liberty Dried Fruit Company in the industrial section of Modesto.

When the apparatus was first started it was rather difficult, on account of the noise from the vents, to be certain that both burners were operating properly, so in order to overcome this difficulty both 6-inch vents were tapped and a ¾-inch line was run from each vent to the front of the machine and lined up with the other control valves. On the end of the ¾-inch lines a ¾-inch stop cock was placed with a St. Ell looking down, so after the burners are started all that is necessary is to open either one of the stop cocks and the operator can readily tell as to the operation of the burners.

At the present time a cold water supply feeds the tank, but it is proposed to install coils around each vent pipe and in this manner feed the tanks with preheated water, which will increase the efficiency of the plant materially.

The Liberty Dried Fruit Company has tried numerous other fuels for the processing of fruit but has come to the conclusion that gas is the ideal fuel.

The following data were secured in a test made at the plant of the Liberty Dried Fruit Company while it was located in San Francisco. Results are applicable to the Modesto plant, however, as conditions are the same as at San Francisco.

Purpose of Test:

To determine:

(1) Costs of processing prunes, using two Surface Combustion Company's E M-75 Immersion Heaters.

(2) Operating Data to show if proper temperature is being held.

Data:

	Gas Used	Pounds Put Through	Cu. Ft. per lb.
August 24th	23,900	36,500	.655
August 25th	24,700	53,525	.461
August 26th	26,000	51,200	.508
August 27th	25,600	45,000	.569
August 28th	18,400	38,425	.453 to 3 P. M.

Combustion:

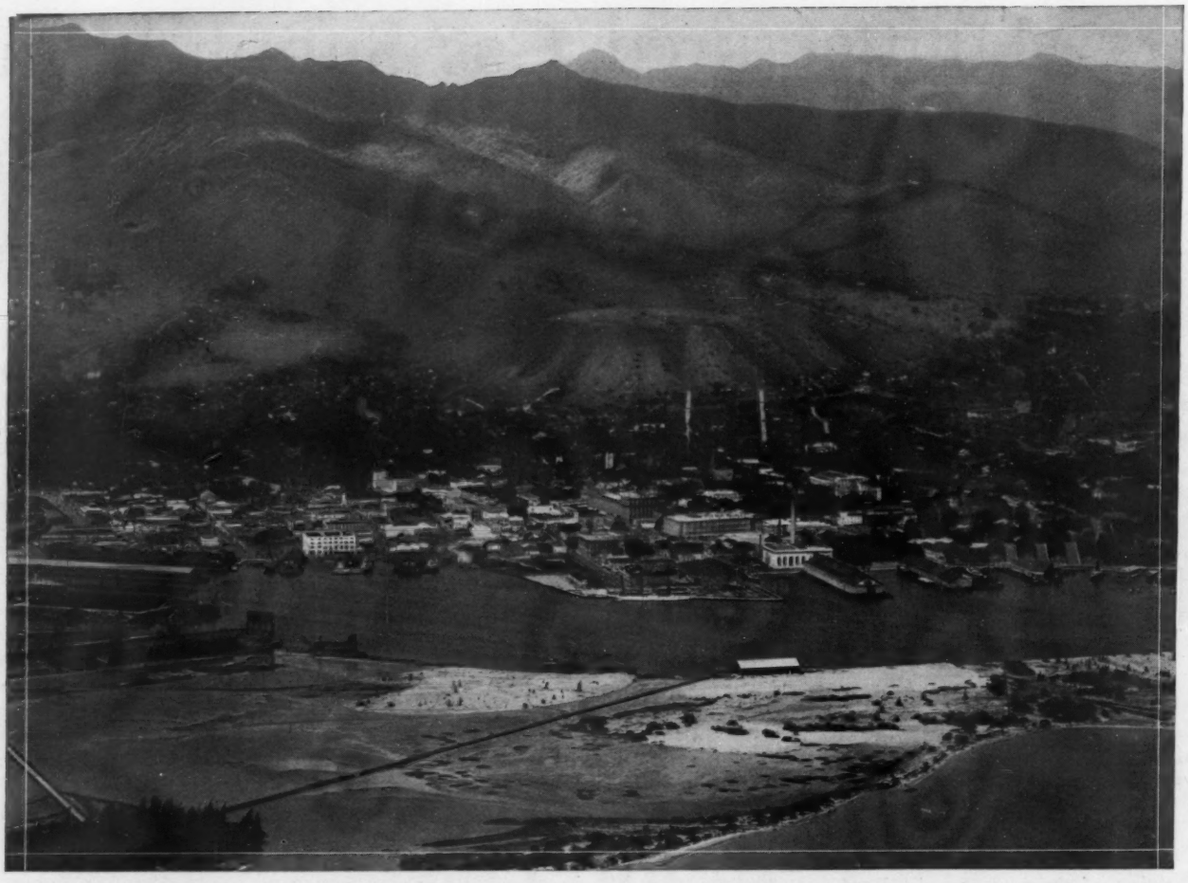
	CO_2	O_2	CO	
Right	9.8	2.6	0	Best Results
Left	10.8	1.6	0	Best Results

Max. pounds prunes per hour 8,000.
Max. gas per hour 3,100 cu. ft.
Approximately 2 lbs fruit per 1 cu. ft. gas.

DISCUSSION OF TEST

The general results were very good. The tank of water was brought to boiling within thirty to forty-five minutes. The temperature dropped a maximum of

(Continued on Page 49)



Scenic Honolulu, Oahu, T. H., where the Honolulu Gas Company, Ltd., supplies the ideal fuel under unusual conditions

Gas Distribution Problems Find Unique Solution *in* Honolulu

By FRANK Q. CANNON
Manager Honolulu Gas Co., Ltd.
AND
C. E. KING

JUST 2100 miles southwest of San Francisco by steamer, in the middle of the Pacific Ocean, fanned by the cooling zephyrs known as the north-east trade winds, lie the Hawaiian Islands, now a part of the United States of America, the Territory of Hawaii.

No more eloquent allusion to this favored group of eight islands has ever been made by poet, historian or globe-trotter, than that of our own "Mark Twain" who christened them "The loveliest fleet of islands that lies in any ocean."

The capitol city of the Territory is Honolulu, on the Island of Oahu, with a population of 104,300 on June 30, 1926. Honolulu, one of the most picturesque cities on the globe, possessed of a natural beauty which evades description, and of an interest drawn in part from the varied nationalities which mingle in its limits, is yet in every sense a modern metropolis, and is the center of the Islands' industrial life.

The principal industry of the islands is the production of cane sugar, which has a historical background of real interest, involving men from many nations of the earth. Its struggles and achievements are inseparably linked with the political, social and economic progress of the Territory. Its history is rich in action and human interest through more than a hundred years of development.

Next in importance to the sugar industry is the growing and marketing of pineapples, which has grown from a modest beginning in the year 1901, with a capitalization of $20,000, to a gigantic enterprise with thousands of acres under cultivation and millions of dollars invested, producing and marketing during the year 1925, the enormous output of six million cases of canned fruit, until today this infant of a decade and a half ago has leaped from almost complete obscurity into the world leadership in the fruit-canning industry.

There are many other industries in the islands of lesser magnitude than the foregoing, among them the gas industry, which like the pineapple canneries has grown from a very small beginning in the year 1905, when operations under a franchise granted by the Congress of the United States, and sanctioned by the local legislature, were begun, with a capital of $190,000 entirely subscribed by local financiers, this new enterprise began the manufacture of oil gas. Its daily output was 10,000 cubic feet and some 75 consumers were served.

Innumerable were the obstacles to be overcome by this new adventure, the percentage of population being largely oriental, and of the lower or laboring classes who had never heard of artificial gas, while some of the oldest missionary families and their descendants were unfamiliar with its use and mortally

(Continued on Page 43)

Clean Oil Essential *to* Efficient Compressor Plant Operation

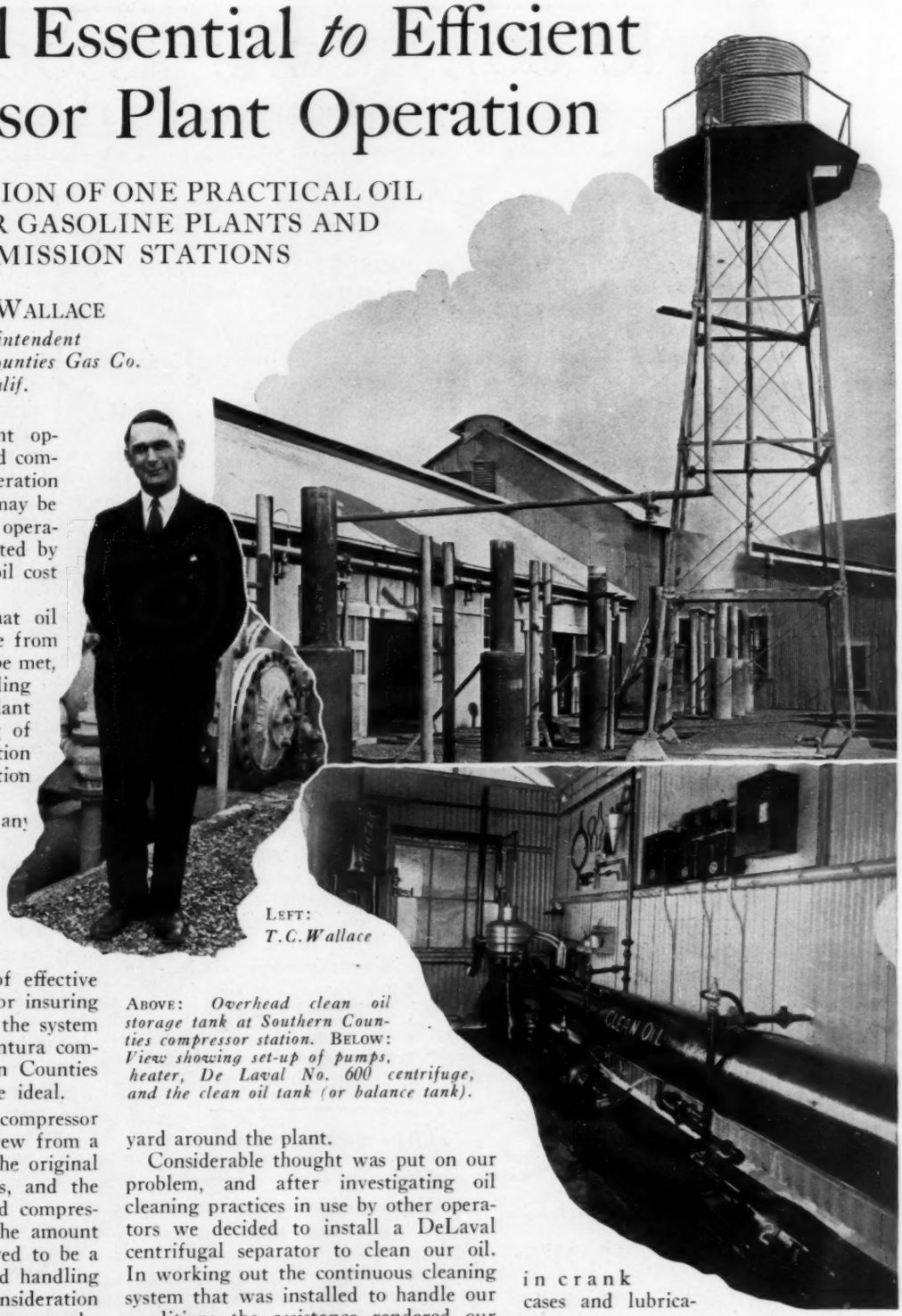
A DESCRIPTION OF ONE PRACTICAL OIL SYSTEM FOR GASOLINE PLANTS AND GAS TRANSMISSION STATIONS

By T. C. WALLACE
Plant Superintendent
Southern Counties Gas Co.
Ventura, Calif.

IN COMPRESSOR plant operation the oil item should command the closest consideration of plant engineers, for to it may be traced a large share of the operation cost, when the toll exacted by poor lubrication is added to oil cost and oil handling expense.

It goes without saying that oil should be kept clean and free from water. If this condition can be met, and at the same time handling costs can be cut, then the plant operator has done something of appreciable value in the reduction of maintenance and operation costs.

I do not believe there is any plant engineer but who will agree that the cleaner the oil in the crank case of a compressor or engine is, the less bearing trouble and necessity for replacement of parts there will be. A number of effective means have been developed for insuring clean oil, but I believe that the system we are now using at the Ventura compressor plant of the Southern Counties Gas Company approaches the ideal.



LEFT: *T. C. Wallace*

ABOVE: *Overhead clean oil storage tank at Southern Counties compressor station.* BELOW: *View showing set-up of pumps, heater, De Laval No. 600 centrifuge, and the clean oil tank (or balance tank).*

Like a good many other compressor stations the Ventura plant grew from a small plant as a nucleus. The original plant consisted of four units, and the present of 32 direct-connected compressors. With the few units, the amount of crank case oil used appeared to be a comparatively small item, and handling costs did not receive the consideration they deserved; but as the plant grew, the amount of crank case oil used, and the amount wasted, also grew, and labor costs for handling the increased quantities of oil mounted. These factors soon called for another man on each shift to properly operate the plant and handle the oil; and our system for crank case oil cleaning was not thought to be satisfactory. At this time we were using a water and charcoal filter, and waste oil found its use for sprinkling the yard around the plant.

Considerable thought was put on our problem, and after investigating oil cleaning practices in use by other operators we decided to install a DeLaval centrifugal separator to clean our oil. In working out the continuous cleaning system that was installed to handle our conditions the assistance rendered our engineering department by E. C. Elvidge, DeLaval Company engineer, was extremely valuable.

Briefly reviewed, our continuous cleaning system is as follows:

We circulate our oil through our crank cases to the No. 600 DeLaval centrifuge, where the oil is cleaned and returned to a storage tank. From this clean oil we fill our lubricators and add new oil each day to make up for oil used in crank cases and lubricators.

We installed a 500-gallon tank at an elevation of 25 feet above the oil level in the crank cases, to give a head on this oil. From this tank we ran two 2-inch header lines over the center of the engines with a shut-off on each line at the tank. From one of these 2-inch headers, at each engine, we ran a one-half inch drop line to the lubricators to be used to fill them. Each lubricator

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PACIFIC COAST GAS ASSOCIATION

A Department Conducted by Clifford Johnstone, Executive Secretary

Biggest Conference Holds Session in Los Angeles

BETWEEN 400 and 500 gas men attended sessions of the Pacific Coast Gas Association's Southern Regional Conference, held February 23 and 24 at Los Angeles. This was undoubtedly the largest regional gathering to date, and places the stamp of approval upon the regional meeting plan which has been inaugurated as an adjunct of association committee work.

The P. C. G. A. board of directors, meeting Wednesday morning, February 23, set definite dates for the ensuing regional conference at Spokane, Wash., which will hold session on May 6 and 7 —and for the annual convention, which is scheduled for Santa Cruz, Calif., September 12 to 16, inclusive. Cooperating with the Arizona Utilities Association a joint meeting will be held in Flagstaff, Ariz., some time in June, definite dates to be announced later.

Most of the sessions at Los Angeles were in the Chamber of Commerce Building, except the general sessions of Wednesday afternoon, which were held in the auditorium of the Los Angeles Gas and Electric Corporation Building.

(Continued on Page 55)

Committee Appointments

The following committee appointments have been reported to the Secretary during the month:

Meters: D. E. Farmer, Chairman.

E. W. Langdon, Sprague Meter Company, Los Angeles.

Holder Location and Maintenance: A. F. Bridge, Chairman.

O. F. Van Buren, Southern California Gas Co., Los Angeles.

H. M. Barnes, San Diego Cons. Gas & Electric Co., San Diego.

Customers' Service: C. R. Miller, Chairman.

W. H. Ulm, Los Angeles Gas & Electric Corp., Los Angeles.

Load Factors: W. M. Henderson, Chairman.

E. T. Floyd, Pacific Gas & Electric Co., San Francisco.

Safety: R. R. Blackburn, Chairman.

F. W. Olsen, Mountain States Power Co., Eugene.

Domestic Sales: W. H. Mixter, Chairman.

C. M. Robert, Los Angeles Gas & Electric Corp., Los Angeles.

Announce Workers for 1927 Convention

MORRIS F. WALES, energetic chairman of the Santa Cruz Convention Committee, has been busily engaged in gathering together a group to assist him in staging the Association's Thirty-fourth Annual Convention.

The Executive Committee is as follows:

R. L. Cardiff, Coast Counties Gas & Electric Co., Santa Cruz.

J. Chas. Jordan, Pacific Gas & Electric Company, San Francisco.

E. G. McCann, Pacific Gas & Electric Company, San Francisco.

J. F. Pollard, Coast Valleys Gas & Electric Co., Salinas.

Don C. Ray, Pacific Gas & Electric Company, San Francisco.

W. M. Thompson, Reliance Manufacturing Company, Pasadena.

M. F. Wales, Coast Counties Gas & Electric Co., San Francisco, Chairman.

Mrs. Henry Bostwick of San Francisco has graciously consented to act as hostess to the ladies who will be in attendance. A. L. Strong of Santa Cruz will supervise the local transportation, and M. L. Foster, also a member of the Coast Counties' Santa Cruz organization, will be in charge of the registration and information desk. It is known that at a meeting of the Executive Committee held in San Francisco on February 8, many novel entertainment features were discussed, but the final decision is a carefully guarded secret.

Appliance Installation and Service Manual

The reprinting of this useful little book is now under way in accordance with the authorization of the Board of Directors announced in December's *Western Gas*. Its text has been carefully reviewed by the Appliance Information Committee under the leadership of E. L. Hall of Portland, and while no major revisions have been made, there are numerous short additions and changes which add to its clearness and usefulness. The words "A Manual for Gas Companies, Appliance Dealers, Architects and Builders" have been added to the title, as the book has been found useful by a number of companies in their efforts to educate architects and builders.

The P.C.G.A. Proceedings are of Growing Value

A COMPLETE set of the Proceedings of the Pacific Coast Gas Association is a treasure to be found in the libraries of only a few of the very oldest members of the Association. The Association possesses only two complete sets and these are closely guarded against loss. A complete set now contains seventeen volumes, the first published in 1898 and covering the five conventions held up to that time following the organization meeting in 1893. We should be proud of the fact that the Pacific Coast Association is now the oldest continuously operated association in the gas industry, and its Proceedings form a historical record of no mean value, covering as they do the change from coal and water gas to oil gas, the advent of the electric light, the discovery of oil in California, the initial use of natural gas, and the many operating and commercial problems which confronted the managers and superintendents by reason of changing times and fast growing communities.

Of the men who speak to us from the pages, many have solved the great problem of death, and a list of their names would be a list of the gas industry's greatest. Those who are now managing our greatest companies are all there, speaking from year to year, first diffidently from the background of an humble position, then with more and more authority as experience and advancement have come to them.

There is a steady demand for back volumes. If any member has copies of Volumes 2, 3, 4, 5 or 15, and will part with them, we would like to send them to the library of John Hopkins University, where they are wanted for the use of students in the course in Gas Engineering.

The Secretary is now engaged, as time will permit, in compiling a brief, consolidated subject index of the first fourteen volumes, which were for the most part not indexed. The thought now is to employ this index only for office use, but as it grows it shows more and more evidence of reference value and its publication appears more and more desirable.

CHARLES N. BOLEY DEAD

Charles Nash Boley, vice-president and salesmanager of the Day & Night Water Heater Co., Monrovia, Calif., died at his Los Angeles home on February 27.

Gas Appliance Selling Wins *in the* Very Stronghold *of* Electricity

By PAUL W. ERNST
Sales Manager, Great Falls Gas Company

THE successful merchandising of gas appliances necessitates a strong sales organization that is backed up by the company with advertising and full cooperation of the other departments. Our policy has been successful in breaking down some strong electrical competition. The problem facing us was to organize a sales department that would put the phrase "You can do it better with gas" on the map in Great Falls, Mont. The activities of our sales department can well be stated in the following subjects which will be discussed separately—Organization, Records, Advertising, Servicing and Home Service Work.

In order to successfully combat the electric competition, it was necessary for us to organize practically a complete new sales organization. Our personnel consists of two domestic salesmen, one industrial salesman, one demonstrator and sales-lady, and the sales-manager.

We have found that the men who make the best salesmen are the keen, quick-minded men who can get right out after the business. It takes considerable nerve at times to be able to get a hearing with the housewife and sales work is not the place for the backward, slow-thinking fellow. The gas salesman who succeeds must always be on the alert and a few jumps ahead of the prospect.

We have divided the city into two districts, one to each domestic salesman. These men spend all of their time in the territory on domestic appliance sales. The industrial salesman has charge of all industrial, house-heating and hotel and restaurant equipment sales and works nothing but these. He has no restricted territory. The sales-lady and demonstrator has charge of the sales floor and takes care of all demonstrations, both in the home and in the store. The above, with the sales manager, comprises our active sales organization.

As we had practically no records in our sales department, our next step was to take a survey of the city to determine what kind of appliances were in use in the homes. When this survey was completed we had a record of the appliances in use in every home in the city. We knew just what homes were using electric, coal and gas ranges and the condition of the same, as well as how satisfied users were with their present equipment. During this survey, reports of many dissatisfied customers came up and were properly taken care of. About three months were spent in completing this survey and we have found that it is one of the most valuable records in the sales department. This record gave us the information on whom to advertise to on certain appliances, as well as giving the salesmen information on the customer which they could not have obtained in any other way.

A record is of very little value unless it is kept up to date. We have tried to do this as far as possible by having the salesmen follow up the meter orders that are issued by the office. A list of these orders is turned over to the sales department daily. The salesman calls on these parties and gets the correct information for the records. This system also enables the salesman to get some very good prospects and sales. When we install new services on appliances in a home, the new equipment is listed on our saturation card. This keeps our files up to date as far as the gas appliances are concerned, while the salesmen get as much information as possible in regard to homes which are not on our lines.

With our records complete, we then decided on our advertising policy. The greatest part of our advertising is done direct-by-mail. As we can pick out each class and advertise directly to them, we find this much more successful than the newspaper, which can only be general in its character. We have not eliminated the newspapers in our advertising but tie them in with our direct-by-mail advertising which is going out nearly all the time. By keeping advertising going out constantly to electric range users, coal range users, old gas range users and others, we have been able to break the main strength of electric competition. We have not only broken the electric competition but have taken out about as many electric ranges as were sold during the year. The people have gas in mind when they go to buy a new range and it is pretty hard to sell them an electric range. We have not completely stopped the sale of electric ranges, but we have made it

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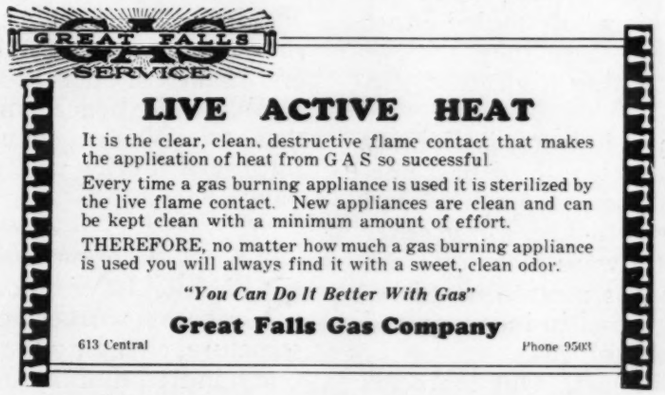
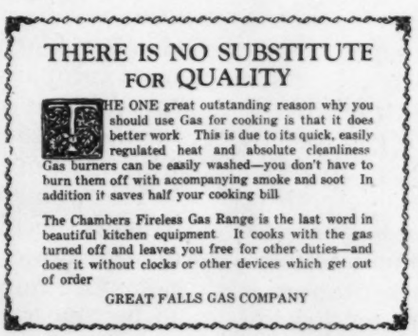

GREAT FALLS GAS SERVICE
LIVE ACTIVE HEAT
It is the clear, clean, destructive flame contact that makes the application of heat from G A S so successful.
Every time a gas burning appliance is used it is sterilized by the live flame contact. New appliances are clean and can be kept clean with a minimum amount of effort.
THEREFORE, no matter how much a gas burning appliance is used you will always find it with a sweet, clean odor.
"You Can Do It Better With Gas"
Great Falls Gas Company
613 Central
Phone 9503

FREE Afternoons
for users of
Chambers Fireless Gas Ranges
IMPROVEMENTS
in Gas Ranges have been as Radical as in
AUTOMOBILES
The New Ranges have Insulated Ovens which are VENTILATED and are full size
Insulated Thermodomes, for all boiling operations
Enameled Ovens and Burners which cannot Rust and are easily cleaned An appearance never equalled in any other type of Range
It is worth your time to Investigate
Great Falls Gas Co.


THERE IS NO SUBSTITUTE FOR QUALITY
THE ONE great outstanding reason why you should use Gas for cooking is that it does better work This is due to its quick, easily regulated heat and absolute cleanliness Gas burners can be easily washed—you don't have to burn them off with accompanying smoke and soot In addition it saves half your cooking bill
The Chambers Fireless Gas Range is the last word in beautiful kitchen equipment It cooks with the gas turned off and leaves you free for other duties—and does it without clocks or other devices which get out of order
GREAT FALLS GAS COMPANY

Examples of direct-by-mail advertising used in Great Falls. Top: For general distribution. Center: To users of old gas ranges. Bottom: To electric range users

EDITORIAL

Where the Sales Responsibility Rests

AGGRESSIVE selling is the only force that will put across the gas industry's program for the future. Admittedly, our operating difficulties are not all solved; refinements in our technology must accompany, must precede all of our progress. But unless the sales idea pervades the whole structure of our industry we are definitely out of the running in this new race between rival industries.

At every turn some competing fuel is nibbling at our load, domestic and industrial. The gas man who will not throw his whole-souled effort into stopping these leaks, before they achieve larger proportions, is watching his future slip away from him.

In this fast-moving age no industry is divinely ordained to endure on the strength of past performances. When electricity stepped in and took the lighting load, gas looked for greener pastures. But we cannot always look for fresh fields. Eventually we must meet competitive fuels squarely, in the home and in industry, and demonstrate the superiority of gas.

We are getting the appliances. Our engineers are at work, and their efforts are to be seen in the new refrigeration, gas incineration, new uses for our product in home and industry. But these goods must not be allowed to remain on the gas company shelf. Their place is out on the line, and this takes selling.

Gas utility executives are everywhere coming to see that the responsibility for the company sales record rests with them. There is no such thing as selling without inspiration, and inspiration comes from the top down, not from the ranks. With the future of the industry at stake it is no mean responsibility, that of our executives.

Making Way for Efficiency

IN EVERY section of the country isolated examples of municipally owned gas systems still raise their heads. The West has not been exempt. But one by one the municipalities gradually come to understand that they are in the nature of things unfitted to their self-appointed utility task, and turn their properties and service responsibilities over to private operators.

Gas systems in two Western communities have just recently been voted over to existing companies. There was some similarity to the cases, for both of the cities were faced by the same alternative. Either a considerable investment to repair and extend an antiquated gas system had to be made, or a privately owned and operated utility company had to be called to the rescue. By majorities that were in both cases significantly decisive, the people of these Western communities registered their disapproval of municipal dabbling in the gas business.

The two companies involved are taking the necessary steps to produce efficient gas service in the communities whose gas systems they acquired. They cannot juggle their finances and show a profit which will satisfy their stockholders. Efficient operation is their only royal road to dividends; hence, efficiency will result, and in these two Western communities, as in others, the improved service will win new converts to private ownership.

A Forward Step in Financing

SEVERAL Western utilities have in recent months worked over their capital stock structure, changing the par value of shares from one hundred dollars to twenty-five dollars. Being an innovation in public utility financing this move will be eyed askance by those who inherently object to changes. But it seems to be in line with good merchandising practice, nevertheless. Twenty-five dollar shares will open up new strata of investors, spreading the thrift habit, and broadening the reach of customer ownership, with all the important implications which that has for a company's public relations.

Wanted—Home Service Workers

HOME service is rapidly winning its way into the gas company scheme of operation, and its popularity in the West is at hand. *Western Gas* is receiving a number of inquiries from company executives, asking where experienced home service workers may be obtained—for the personnel problem seems to be the factor which is limiting the extension of home service.

The woman who can carry the home service banner successfully is a combination of rare qualities, and it is small wonder that her kind is not more numerous. She is not only expected to become an asset to the sales department, increasing gas sales per individual customer, and stimulating sale of appliances as well—but she is the most effective kind of good will ambassador.

The Public Must Know—*and* Apply—*the* Essentials *of*

VENTILATION

By F. J. SCHAFER
General Manager, Southern California Gas Company

¶ Every gas company would do well to keep the essential and simple principles of ventilation before the minds of its patrons. It can be done without prejudice to gas as an efficient fuel, for ventilation is a prime need wherever any fuel is burned. Mr. Schafer, in his lecture given before the Gas Appliance Association's school, which was conducted by the extension division of the University of California, gives a review of some of the more important of the "a-b-c's" of this subject of ventilation.

IN these days of universal education there should be little need for any arguments or discussion on the question of merits of ventilation, since it is a matter that vitally concerns the health of a community, not only during periods of artificial heating in the home, but at any time, and in any place where human beings foregather, in the office, in the shop, in the auditorium, in the banquet hall, in the living quarters, and particularly in the bedroom and bathroom.

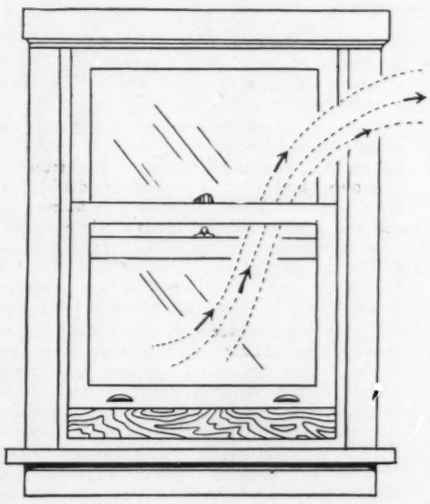
The air we breathe is composed of two gases, oxygen and nitrogen, in the proportions of about one part of the former and four of the latter. Oxygen may be termed the aerial food, both for fire and animal life, as both are absolutely dependent upon it for existence. The nitrogen serves merely as an inert solvent for the oxygen (which in its pure form would be far too concentrated for human consumption); the nitrogen itself possessing no life-giving or flame-sustaining properties.

A PRIMARY EXPERIMENT

Most of you are familiar with the primary experiment of the glass tumbler and the candle: A candle is lighted and a tumbler placed over it. Thereupon the flame flickers and is soon extinguished. This is caused by the oxygen of the enclosed air uniting with a portion of the material forming the candle. In this way there is produced, first a compound of complete combustion called carbonic acid gas (CO_2), which suffocates the flame; and then, as the oxygen is reduced, another compound, known as CO, which is the product of incomplete combustion.

If a number of people are assembled in a confined space where the supply of fresh air is limited, they would, by the process of respiration, in a manner analogous to the actual fire, consume the air and produce the compound first mentioned in the experiment of the candle, and when air is contaminated in this way it is productive of lassitude, headaches, and sickness in the person breathing it.

If the air contains any appreciable quantity of CO_2 and is breathed for any length of time, death will result from slow suffocation, just as surely as the flame of the candle died from want of oxygen. The candle, however, goes further than the living body in producing,



Illustrating a simple ventilation device

under conditions of inadequate oxygen supply, another gas much more injurious than the first. It is with this second gas that we are chiefly concerned in considering the matter of heating and ventilation.

In this way we learn, in an elementary manner, that oxygen, or fresh air which contains it, is absolutely essential both to fire and animal life. Now a gas appliance, or any wood, coal, coke, or oil-burning device, no matter how perfectly constructed or how scientifically adjusted, will, under favorable conditions, produce CO_2, and under unfavorable conditions, CO. It is true that any appliance supplied with a proper vent leads the products of combustion to the outer air, but this is only true where fresh air can be admitted to the room or space in which the appliance is operating, so that the foul air may be displaced.

Proper ventilation, therefore, should be one of the first considerations in any human habitation.

The question may be asked, "What is the use of guarding against CO_2 when, particularly in a large city, enormous quantities of this gas are generated daily by its millions of inhabitants, by its industrial plants, and by all the domestic uses to which fire is put?" It is hardly necessary to explain that this gas is absorbed by plant life, which reverses the process of combustion by breaking down CO_2 into its original elements, carbon and oxygen, retaining the carbon for its growth, and setting free the oxygen in a pure state. Like all other gases, CO_2 is readily diffused, and, aided by the four winds of heaven, it is carried into the wide world to sustain life in the vegetable kingdom.

Following this natural law, proper facility should be given in all enclosed habitations for the escape of the consumed air and for free entrance of a fresh supply.

Whenever the element hydrogen is a part of any substance consumed by fire, there is formed another product, water vapor, which is effected by the union of oxygen with the hydrogen in the process of combustion and the amount of vapor formed will be in proportion to the hydrogen content in the combustible.

A similar process takes place in animal life, for at each expiration of the lungs, vapor, mingled with the breath is expelled, and may be made evident by condensing it on a bright cold surface such as a looking glass, or, in a cold atmosphere it will become perceptible as it issues from the nose and mouth.

WIDE NEGLECT OF VENTILATION

While the general question of ventilation is most important, and most simple, yet, under the apathetic condition of the public mind, it is a most difficult task to secure attention, and a still more difficult one to obtain action.

Elaborate systems of ventilation are sometimes less advisable and less effective than some simple home-made affair, and many air ducts and vents have been closed up, and discontinued as such, because a certain direction of wind made them objectionable. Arrangements which may be giving complete satisfaction in calm or warm weather are frequently a failure in cold or stormy weather,

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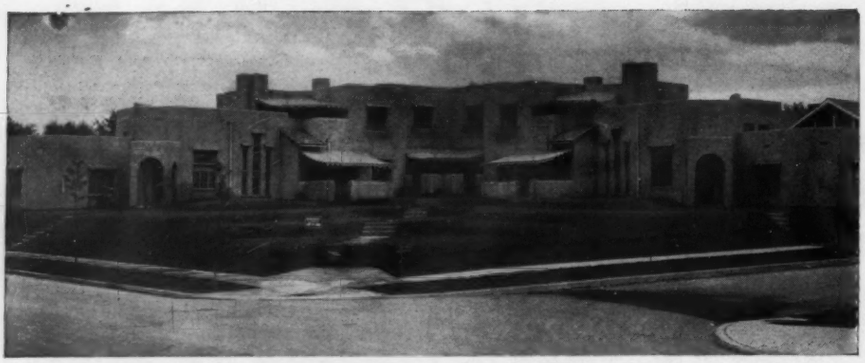


The Denver, Colo., apartment house which taxed ingenuity of heating experts

Gas Furnaces Provide *the* Solution *for* Heating Puzzle *in* Denver

By O. O'DONNELL
Public Service Company of Colorado, Denver, Col.

THE problem of successfully heating one of the oddest shaped apartment houses in Denver has been solved by the Public Service Company of Colorado. Again gas has proved the best house heating fuel.

The building shown in the photograph contains six apartments, each of which has private front and rear entrances. Two of the apartments have one bed room, two have two bed rooms and two have three bed rooms.

Interior artistic requirements would not permit the use of radiators so the original builder arranged a hot-air pipe for the individual apartment basement to each room of the apartment. Heat for these air pipes was supplied by blowing through a copper-finned radiator, air taken out of the apartment through a single floor opening. A blower supplied the necessary circulation. Current for the blower was controlled by either of two switches, one of which was placed in a bed room and the other in the living room. If the temperature rose to the desired point, the occupant could shut off the blower and thereby reduce the delivery of heat to the rooms.

The basement of one of the apartments was slightly larger than any other, and this extra space was used to accommodate two flash type boilers which were fired by oil burners. Automatic control by a pressures'at regulated the fire. After lighting the fire in the late summer months, steam pressure in the boiler would be maintained until the first warm weather of spring.

Due to the fact that there was an appreciable distance between the boiler and the particular steam coil which supplied heat for either of the end apartments, the radiators had to be placed as high as possible in order that condensate could return to the boilers. Having the radiators suspended from the ceiling necessitated placing the blower on an angle iron mounting which caused an appreciable vibration noise throughout the building.

INCONVENIENCE WITH OIL

Noise of intermittent firing of the oil burner made the apartment immediately above the boiler room undesirable. Because of structural details it was necessary to locate several warm air pipes in exterior walls, with the result that air, starting from the basement at only the temperature of low-pressure steam, was pretty cold on reaching a second-story room.

Even a casual inspection of the original plant would disclose the ease with which gas would eliminate many of the troubles. The noise and odor of oil burners could have been disposed of by placing gas flames under the boilers as they stood. It was evident, however, that the other troubles would still exist; and in addition the cost of maintaining pressure during mild or moderate weather would be an appreciable item.

Warm air furnaces offered a pleasing solution. Six furnaces would be required, one in each basement. A master meter was placed in the original boiler room and the original live steam line was used as a fuel run to carry gas to each furnace location, that is, to each of the other five basements.

Since a warm air furnace takes its cold air at the floor line, the blowers were lowered and fixed to the concrete floor. In addition to this advantage, the new source of heat permitted warm pipes to go directly from the top of the furnace to the various sides of the room, and the alignment of the pipes was improved. Warm air leaving the original radiator was travelling in a horizontal direction and all pipes to upper rooms had to be connected to meet this current of air.

In place of the two switches originaliy controlling the blower, a standard heat regulator, without clock, was placed in each dining room, connected to control both the gas flame and the blower. During mild weather no heat at all was needed and none was used.

GAS FURNACES THE SOLUTION

Gas furnaces have removed the noise and odor nuisance; they have permitted automatic control with corresponding saving in fuel cost; they have provided a source of temperature sufficiently high to counteract the cooling effect previously apparent in pipes which passed through exterior walls. Blower noise has been quieted.

The organization of the Public Service Company is such that day and night service is available in case anything should happen to prevent proper operation of any of the furnaces.

During vacancies the realtor who has charge of renting the building sets the thermostat at some low temperature and keeps the building ready for immediate occupancy without the expense of draining the entire plumbing system. It is suggested as a possibility that some day the building will be sold to the occupants, making what is known as a co-operative apartment, and if this happens, each occupant can pay his own fuel bill.

BEGGS, OKLA., HAS IMPROVED GAS SYSTEM

The Beggs Gas Company, serving Beggs, Okla., is making a number of major improvements in the gas system of that community, including the renewing of eleven blocks of old lines, laying of four blocks of larger lines, and a new reducing station. An appliance inspection program has also been launched.

RICE COUNTY NATURAL GAS CO. CHANGES HANDS

Control of the Rice County Natural Gas Co., organized by O. A. Boyle of Wichita, Kan.. to furnish gas to communities in Rice county, has passed to interests back of the Larutan Fuel Co. and the Wichison Industrial Gas Co. R. B. Newbern, secretary of the Wichison Industrial Gas Co., is president of the company under the new ownership. Consumers in Lyons, Sterling and Nickerson are supplied by the company.

HARVEY NOW SALESMANAGER IN WEST FOR DOHERTY SHARES

R. C. Harvey of Kansas City Mo., was recently named salesmanager of the consolidated full-time and customer ownership offices of H. L. Doherty & Co., for the Western District, with headquarters in Kansas City. The Doherty customer ownership offices of Kansas City, St. Louis, St. Joseph and Sedalia are in the Western District and will be under Harvey's supervision.

DEPLETION ALLOWANCE RULING FAVORS OPERATORS

An important and favorable ruling has just been made by the Income Tax Bureau whereby operators of oil and gas wells are permitted to take a depletion allowance on the basis of 27½ per cent of their gross income, even though the cost of the well has been fully written off in prior years, according to M. L. Seidman, tax expert of Seidman & Seidman, Certified Public Accountants.

NEW ROYAL HAWAIIAN HOTEL EQUIPS GAS KITCHEN

A battery of eight sections of Garland ranges installed in the new Royal Hawaiian Hotel, which has been constructed at Waikiki, has been equipped to burn gas supplied by the Honolulu Gas Co., Ldt. Ranges in the kitchen of the employees' cafeteria will also burn gas.

OKLAHOMA UTILITY MEN MEET IN MARCH SESSIONS

About 800 public utility executives and employees from Oklahoma and neighboring states are expected to attend the ninth annual convention of the Oklahoma Utilities Association which meets at the Huckins Hotel, Oklahoma City, March 8, 9, and 10. Earl W. Hodges, director of public relations for H. L. Doherty & Co., is to be the principal speaker at the annual banquet, the evening of March 9.

DENVER FRANCHISE OPENS WAY TO GAS IMPROVEMENTS

VOTERS of Denver, Colo., went to the polls on Tuesday, February 8, and by a margin of 19,007 to 7,900 granted the request of the Public Service Company of Colorado for a new 20-year franchise in Denver.

Outstanding provisions of the franchise which affect gas service call for:

A gas rate of 90 cents per thousand cu. ft.

A 90-cent minimum charge.

A 10 per cent additional charge on bills not paid within 10 days after rendering.

An unchanged B.t.u. standard—400 B.t.u.

The franchise makes provision for both artificial and natural gas service. It is stipulated that if the Denver city council during the first ten years of the life of this franchise decides that natural gas service is feasible, the company must begin such service within two years or pay $50,000 to the city each year for the remainder of the franchise. In the last ten-year period of the franchise the same provision holds, in the event that the city will give the company a 20-year franchise.

As a result of the successful conclusion of the franchise matter, persistent rumors again begin to crop out, pointing to the possible construction of a 450-mile natural gas line from the Amarillo, Tex., fields, which would call for an expenditure of about $12,000,000, in addition to a large sum required to revamp the distribution system for natural gas service. With natural gas discoveries being made almost daily, much closer home than Texas, the company naturally is loth to tie itself up to the extensive transmission project if there is a less expensive "out."

In any event, the new franchise opens the way to important improvements in the Denver gas facilities. Clare N. Stannard, vice-president and general manager of the company, is quoted as stating that if the introduction of natural gas is not found practical a new gas plant will be constructed, to cost $800,000.

MILWAUKEE GAS COMPANY MAKES LARGEST BUDGET

Said to be the largest appropriation made for a number of years by the Milwaukee Gas Company for expansion, $1,250,000 has been allotted by that utility to 1927 extensions. Most of the appropriation will go to extend lines and meters to fast-growing suburbs and outskirts of the city. For the past several years the annual sum demanded for extensions of service has been about $1,000,000.

ONE AND ONE HALF CENT RATE DROP IN PORTLAND AREA

Effective February 19, a rate reduction of one and a half cents per thousand cubic feet was applied by the Portland Gas & Coke Co., as a result of a drop in the price of oil. An aggregate of 3,605,224,000 cu. ft. was consumed in the Portland area in 1926, according to Guy W. Talbot, president of the company, which was an increase of one per cent over the year previous. The small increase resulted from the unusually mild weather throughout 1926.

BAIN'S OFF FOR EUROPE

Ferdinand R. Bain, president and general manager of the Southern Counties Gas Company, accompanied by Mrs. Bain, left Los Angeles on February 17th for a three-months tour of Europe. From New York they sail on the Aquatania for the continent, and their itinerary includes Paris, Milan, Vienna, Berlin and London. They will motor through many of the European provinces and are scheduled to return to California about June 1st.

NEW FINANCING BY UTILITIES BREAKS ALL RECORDS

For the sixth consecutive year, the public utility industry of the United States has led all other industries in the amount of new money obtained from the sale of securities to employees, customers and the general public.

Total amount of new public utility financing in 1926 was $1,604,000,000 compared with $1,495,000,000 in 1925, or an increase of $109,000,000, according to the American Gas Association.

During the period 1922 to 1926 inclusive, the public service companies obtained a grand total of $6,038,000,000 of new money for their extension and betterment programs, a record which the Association believes is without a parallel in the history of corporate financing in America.

A. B. DAY NAMED EXECUTIVE V.-P. AND GEN'L MGR. OF L. A. G. & E.

The annual stockholders meeting of Los Angeles Gas and Electric Corporation was held Wednesday afternoon, February 9. President Baurhyte presented his annual report, and all of the old board of directors were re-elected. These are Wm. Baurhyte, A. B. Day, C. O. G. Miller, W. B. Cline, T. P. McCrea, A. Schilling, H. L. Masser, W. E. Houghton, W. M. Van Dyke, Paul Overton and C. S. Vance. At the directors' meeting following the stockholders session, A. B. Day, formerly first vice-president and general manager, was made executive vice-president and general manager. No other official changes were made.

A. B. Day

LEEDS, ENGLAND, TO BE SITE OF 100 GAS EQUIPPED HOMES

Public health officers and housing authorities are cooperating in building 100 homes in Leeds, England, which will be completely fitted with gas and electric equipment. Leeds is one of the smokiest of cities, and records are to be kept of maintenance costs of the new homes, looking to wider use of the smokeless fuel.

MIDWAY APPLIES FOR PERMIT TO LAY NEW LINE

Midway Gas Co. has applied to the Railroad Commission for a certificate authorizing the construction of a 16-inch natural gas line, extending from the junction of the Midway Gas Company's 13-inch Ventura gas line and the two original gas lines of that company from Taft, at Castaic Junction to a point in Los Angeles County at West Glendale where it will connect with the natural gas line terminal of that company. The Midway Gas Co. is now distributing approximately 175,000,000 cubic feet of natural gas, and proposes to pipe a large quantity of additional gas from the Ventura River oil fields by means of the new line.

CARBON PLANTS, PIPE LINES, IN ROCKY MOUNTAIN REGION

During the past year three carbon black plants have been erected, one each in Wyoming, Montana and Utah. There have been six new gas lines and three new oil lines laid in the Rocky Mountain region. Two of the gas lines were laid in Wyoming and four in Montana.

$500,000 RESEARCH FUND WORK IS UNDER WAY

THREE important projects are already being organized as a part of the research program made possible by the American Gas Association's allotment of $500,000, announced in October.

Through taking out a membership in the America Institute of Bakers, Chicago, Ill., the A. G. A. will develop a gas-fired baking oven of the highest possible efficiency. Already an oven has been installed, and one of the fundamental problems to be undertaken is the determination of what type of heat produces the best bread. The test oven has three chambers, one for indirect heat, one for convected heat, and the third for radiant heat. The researches in baking will be most comprehensive as the baking industry represents a potential load of 34 billion cubic feet of gas annually.

As a second project, a test brass-melting furnace has also been installed in the plant of a leading manufacturer, and research will be conducted on the melting and annealing of non-ferrous metals.

An oven furnace is also being developed at the plant of a Chicago machine company.

As outlined by the Association, the research program will include investigations into the following fields: Food stuffs, non-ferrous metals, forgings, heat treating, drying, ceramics, and miscellaneous heat operations.

HUNTINGTON BEACH CITIZENS VOTE TO SELL GAS SYSTEM

Citizens of Huntington Beach, Calif., in an election of February 8 voted to sell the city gas system to the Southern Counties Gas Company, the ballot being 425 to 74, accepting the offer of $75,000 previously made by the company. The city has about 1500 gas consumers.

As a result of oil developments within the limits of the residential section of the city, it became necessary to move the residential section, which involved extensions to the existing gas system.

SO. CALIF. GAS TO SELL ONE MILLION PREFERRED

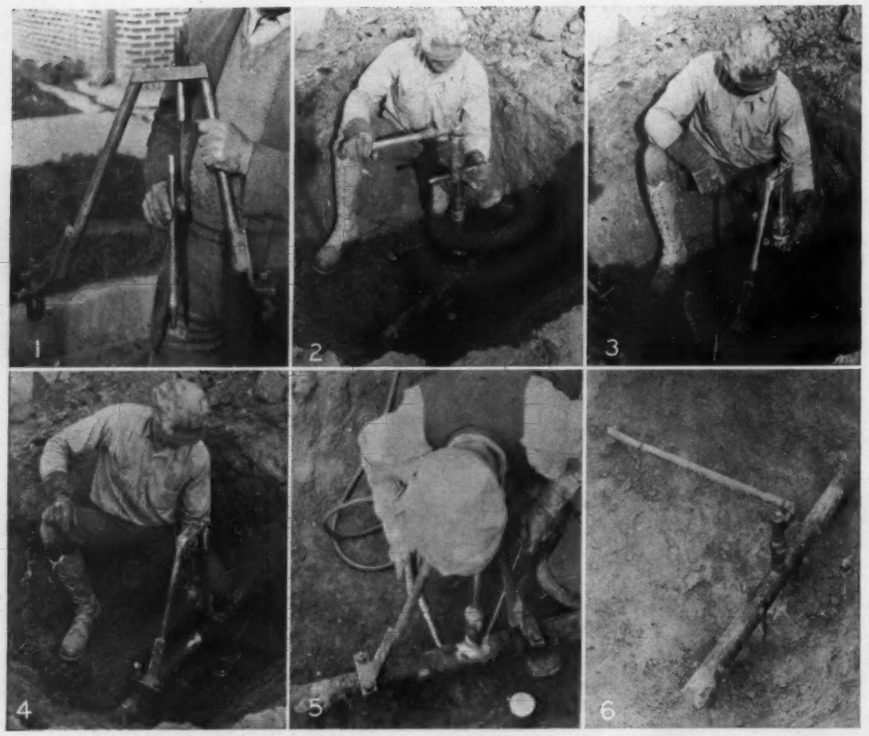
Permission has been granted by the California Railroad Commission for the Southern California Gas Company to sell one million dollars of preferred stock, Series A. par value twenty-five dollars. This is the first offering made by this company since the authorization to increase their capitilazation from ten to one hundred million dollars. Money received from the sale of stock is to be applied to the expansion of the company's properties. Also permission has been granted to exchange four shares of the new issue of stock, par value of $25, for one of the previous issue of $100 par value. This applies to both preferred and common stock.

JAN. SENDOUTS SHOW GOOD GAS CONDITIONS AT SAN FRANCISCO

Gas conditions in San Francisco would seem to approach the ideal, if we are to judge from the records of January sendouts in that city. J. M. Dickey, superintendent of the Pacific Gas and Electric Company's Potrero gas plant, supplies the following figures, which show a remarkably small range between maximum and minimum daily sendouts:

Total sendout for January..993,058,000 cu. ft.
Daily average ..... 32,034,000 cu. ft.
Maximum day (Sat., Jan. 22) 36,192,000 cu. ft.
Minimum day (Sun., Jan. 2) 25,069,000 cu. ft.

The first of a series of joint Safety Meetings contemplated by the Missouri Gas & Electric Service Company for 1927 was recently held in Richmond and attended by over sixty employees.



The new method shown in pictures: (1) Close-up of bracket and pin used, (2) Reaming the old corporation cock, (3) Removing the saddle, (4) Placing the coupling, (5) Spot brazing the coupling to the main, (6) The finished job.

A New "Wrinkle" Is Evolved *for* Replacing Saddle Connections *with* Couplings; No Shut-downs

By WALTER T. RICH

District Manager Southern Counties Gas Company
Whittier, Calif.

IN a leakage survey of the distribution system of the Southern Counties Gas Company in the Whittier District it was found that a number of leaks were in service saddles on our mains.

Inasmuch as we were no longer using saddles but were brazing couplings on the mains, then tapping through these for our service connections, it was decided to adopt some method to replace the present saddle connections with couplings without shut downs on the various mains.

The following description with photographs is the result. This method was worked out by our Mr. R. L. Taylor who has charge of our leakage work and it is he who is holding the bracket and pin which are accountable for the success of the method.

The majority of our high pressure service connections consist of a ¾ inch double strap saddle and a ¾ inch corporation cock through which has been run a ½ inch tap in our main.

The bracket as shown in the photo I believe is self-described by the picture. The pin is 9/16 inch tapered to 7/16 on the end and case hardened.

Two methods are used in removing the saddles and brazing on the couplings, the methods depending on the pressures carried in the mains. On pressure up to 20 pounds the corporation cock is closed and the service line cut loose, the pin set into the top of the cock and the bracket moved into position and tightened on to the main. This insures the pin being in direct line with the hole in the main. The pin is then removed and the corporation cock backed out of the saddle, then the pin placed in the hole and held by hand. During this short period of time there is gas escaping. With the pin held in place by hand the saddle is now removed and passed over the pin and a coupling put over the pin and the pin tightened into the hole by the pin clamp in the bracket. The coupling is now centered and brazed on to the main, the pin removed and the original corporation cock which has been greased and opened is screwed into the coupling and closed, the service fitted up and welded where the cut was made and the job is finished.

On higher pressures the method used is shown by this series of photos and is described as follows: After the service is cut and stripped down to the corporation cock, the hole in the corporation cock is drilled out with a ⅝ inch drill as shown in photo No. 2—the cock is closed as the drill is removed—the bracket and pin set in place—the cock opened and the pin clamped down into the hole in the main. The saddle straps are now removed and the saddle on corporation cock slid up the pin—the pin clamp backed off and the saddle and cock removed over the top of the pin. During this short period of time the pin is held by hand. A coupling in which a corporation cock already tapped out to ⅝ inch and greased has been screwed by hand is then placed on the pin and down onto the main and the pin clamped tight. The coupling is then spot brazed to hold it in place, the cock backed out of the coupling, slid up the pin and wired to the top of the bracket. This is done in order that the heat from brazing will not destroy the cock grease. The coupling is brazed on—the cock screw in the coupling, the pin and bracket then removed and the service connected up again. The original cock is now taken apart and the core ground into the body with valve grinding compound, as it was found that in some cases after this cock had been tapped out to the ⅝ inch hole bits of drillings had scored the core when the cock was shut off. This cock now is ready for the next service.

We have in the past six months replaced several hundred saddles by this method and we feel we have settled one of our leakage problems.

NEW RATE ON GAS APPLIED BY TRUCKEE RIVER POWER CO.

Truckee River Power Company, Reno, Nev., has applied a new gas rate. Joseph T. Sullivan, superintendent of of the company's gas department, sends *Western Gas* the following tabulation of the rate now in effect:

First	1,000 cu. ft. at	25.4c	per 100 cu. ft.
Second	1,000 " " "	23.5c	" " " "
Next	8,000 " " "	13.0c	" " " "
All over	10,000 " " "	12.0c	" " " "

The minimum charge is $1.15 which permits a consumption of 200 cubic feet.

A penalty of 25c per M. is added if the bill is not paid within ten days.

HOUSEHEATING

10c per 100 cu. ft. plus 1c per 100 cu. ft. if not paid within ten days. Minimum $100 per heating season.

This rate became effective January 17, 1927.

The former rate was as follows:

First	1,000 cu. ft. at	25.0c	per 100 cu. ft.
Next	2,000 " " "	23.5c	" " " "
Next	3,000 " " "	20.5c	" " " "
Next	4,000 " " "	17.5c	" " " "
Next	5,000 " " "	14.5c	" " " "
All over	15,000 " " "	12.5c	" " " "

Penalties the same as the new rate.

There was no special rate for househeating.

It will be necessary to increase gas sales 25 per cent during 1927 to secure the same net revenue as during 1926.

SANTA MONICA RATES HIGHER FOR SOUTHERN COUNTIES

Southern Counties Gas Company has been authorized by the Railroad Commission of California to place in effect temporarily a schedule of rates applying to the distribution of natural gas in its Santa Monica District, Los Angeles County, under which the rates are approximately 15 per cent higher to the general consumer than under the old schedule of mixed gas rates.

This ruling is in line with the recent decision which resulted in the Los Angeles Gas and Electric Corp. and the Southern California Gas Co. going on a natural gas basis. The latter utility wholesales gas to the Southern Counties for distribution in its Santa Monica District, which includes Santa Monica, Palms, Venice, Ocean Park, Culver City, Sawtelle and adjacent territory.

PACIFIC GAS RADIATOR CO. IS STILL FIRM NAME

Officials of the Pacific Gas Radiator Company, Los Angeles, who recently announced a new firm name, the Pacific Gas Heating Company, wish it understood that the name of the original organization has not been changed. The Pacific Gas Radiator Company produces and wholesales a complete line of gas heating equipment in the West, and the new organization, the Pacific Gas Heating Company, has taken over the offices of the parent project at 1732-40 West Washington Street, Los Angeles, where it is engaging in retail business.

BUREAU OF MINES SEES MANY PHASES TO LIGNITE PROBLEM

Several methods of approach to the problem of the successful utilization of lignite are possible, states the Bureau of Mines, Department of Commerce. Any process whereby lignite can be profitably converted into more valuable and salable products will help to develop this latent source of energy. Accordingly an investigator might well study any of the following phases of the lignite problem:

A cheap means for completely gasifying lignite, including an improved method of making producer gas and a suitable method for making water gas.

A means for producing a solid fuel other than by briquetting the carbonized lignite.

The possibility of developing a means of coking lignite.

The commercial applicability of the carbonizing and briquetting process and its relation to by-products and methods for plant control.

A method for producing valuable crude liquid products by the distillation of lignite, with attention to the influence of changes in conditions, such as pressure, temperature, and rate of heating, on the character, quantity, and quality of the resulting products.

GAS TO SERVE PORT OPERATOR FOR MANY USES

The Port of Portland, an organization operating two dry docks in the City of Portland, besides activities in keeping the harbor channel open to traffic, have equipped their dry docks and repair machine shop with gas equipment for a variety of operations. The machine shop will use gas fuel in a number of furnaces where the gas on the dry dock is used for cutting steel plate and for preheating stern posts and propeller housings preparatory to welding. Gas is also used for removing boiler furnaces. This latter operation had previously been performed by the use of actelyne gas which was brought on board ship in the customary tanks. A 2-inch pressure line with a capacity of 20,000 cubic feet per hour has been installed. This line branches to the machine shop as a 1-inch high pressure line; the 2-inch line is continued on the dock for approximately 800 feet with tees in every length of pipe to serve the repair crews working on board the ships in the dry dock, by means of armored hose.

GAS PLANT TAR NOW USED TO AID AGRICULTURE

If seed corn is coated with tar from the gas plant, crows will not dig it up and eat it. If a cordon of tar is spread around a field, the all-devouring army worm will not cross it. If gas tar is mixed with sulphur and spread, the destructive red spider of the West Indies takes his departure.

These are three recently discovered agricultural uses for gas plant tar, which has become a raw material from which more than a thousand valuable products are now produced.

From each ton of coal used in the manufacture of gas, 12 gallons of tar form part of the by-product. Only 40 years ago the slimy black substance was considered worthless. In January, 1887, the Chemical Industry Society of London held a meeting to answer the question, What shall we do with our tar?

Since that time industrial chemists have developed an ever-increasing list of valuable coal tar products, varying from medicines to high explosives, from roofing to delicate perfumes, from dyes of every color to rubber compounds, and from fish-net preservatives to clay pigeons for trap-shooters.

LITTLE BUFFALO BASIN LINE IS LATEST WYOMING PROJECT

RUNNING a distance of 57½ miles from the Little Buffalo Basin gas field to tie into the Hidden Dome-Greybull gas line near Jordan's Mill on the Norwood River, a gas line is to be laid by the Midwest Refining Co., Casper, Wyo., for the Big Horn Gas Co., a subsidiary of the Midwest-Wyoming Gas Co. When complete the line will be operated by the Midwest-Wyoming Gas Co., whose headquarters are in Basin, Wyo. Cost of the project is estimated at $1,600,000.

The line will consist of 13.8 miles of 12-inch pipe, and 42.6 miles of 14-inch pipe. A 6½-mile lateral, of 8-inch pipe, will be laid into Worland, where the Wyoming Gas Co. will distribute gas. A 5½-mile lateral may also be laid into the Grass Creek field. From the Worland lateral a smaller line will be extended to supply the Wyoming State Industrial School at Coulter.

All trenching work for the line, which is to be buried to a depth of 42 inches, is to be complete by June 1. The pipe will be painted, and an 8-mile section through irrigated land will be wrapped.

The refinery of the Standard Oil Company (Indiana) at Greybull is a large user of gas from the lines of the Midwest-Wyoming Gas Co., and the new line will assure an adequate supply for this purpose, as well as for the communities of Basin and Greybull.

White Motor Truck Co. of Casper has the contract for stringing 13,000,000 lbs. of pipe for the line. The pipe is of plain end type, and Dresser couplings will be used.

LONG BEACH VOTERS ASKED TO SANCTION GAS MEASURES

Following a municipal election to be held early in March, the gas department of the city of Long Beach, Calif., will on March 15 open bids on extensive additions to its gas system. Three separate items are contained on the ballot, the major one being provision for a $750,000 gas holder of 10,000,000 cu. ft. capacity, of which the city is in great need. The gas department also wants to extend its mains to the industrial district near Wilmington, to reach the new Ford automobile plant and provide for other users coming into this section. The third measure would provide for extending service to North Long Beach.

Storage facilities of the city are now limited to 2,500,000 cu. ft. which is obviously negligible, considering the city's peak of 30,000,000 cu. ft. a day, and normal demand of 20,000,000. Cold weather loads this past winter put a 1,500,000 cu. ft. per hour demand upon the gas system. Future gas service will depend much upon storage facilities, say officials of the city gas department, especially in view of the natural gas supply situation. Seal Beach is not yet a strong source, and Signal Hill is declining measurably.

NEW MAINS AT WOODLAND

Installation of 3130 feet of four-inch gas main and regulators is being planned to increase gas pressure in the northern section of Woodland, Calif., served by the Pacific Gas and Electric Co.

UTILITY MANAGER TO HEAD CHAMBER OF COMMERCE

W. A. White, manager of the Oklahoma Gas & Electric Company, has been elected president of the Pauls Valley Chamber of Commerce for 1927.

PAYNE AT CLEVELAND SESSIONS OF HEATING COMMITTEE

El Roy L. Payne of the Payne Furnace and Supply Co., Los Angeles, who was recently asked to serve on the A. G. A. committee on specifications for central house heating equipment, left Los Angeles on February 17 to attend the meeting of that committee held in Cleveland on February 28. E. D. Milener, of the Baltimore Gas Company, is chairman of the committee, work of which concerns test specifications for floor furnaces, basement furnaces, steam boilers, hot water boilers, etc.

El Roy L. Payne

Following the committee sessions, Mr. Payne planned to go on to New York, and on returning, to stop at Columbus, where the National Warm Air Heating and Ventilating Association has headquarters. Mr. Payne is now serving on the general committee of this organization, in which his company has a manufacturing membership.

Mr. Payne's appointment on the house heating specification committee of the A. G. A. is highly logical in view of the pioneering done in this field by his company, which has more than twelve years of service to the gas industry to its credit.

STUDY GIVEN CAUSES FOR BROWN STAIN ON HOLDERS

The Portland Gas & Coke Co. is engaged in research work the purpose of which is to ascertain the cause and character of the brown stain which accumulates on the lower lifts of its holders. The general appearance of these holders, which are painted gray, has been improved by washing off the brown stain several times between painting intervals. This washing is accomplished by scrubbing the surface of the lift near the water line with stiff bristle brushes as the holder rises. So far as can be determined no damage is done to the paint by this process. It is hoped, however, that the research work now under way will disclose a means of eliminating this stain and reducing not only the washing but also the repainting expense as well.

A. G. A. TECHNICAL COMMITTEE HEAD TO VISIT COAST

Walter C. Beckjord, vice-president and engineer of the American Light & Traction Company and chairman of the Technical Section of the American Gas Association, is expecting to make a trip to the Pacific Coast early in April to confer with Western engineers upon the technical problems facing the gas industry.

The Technical Section of the American Gas Association has been asked to make an economic and engineering survey of the gas industry, and include in their study consideration of investment, production, distribution, utilization and rate problems as these are affected by the changing conditions in character of load and supply of raw materials.

NEW HOLDER AT COLUMBIA

Missouri Utilities Co. is erecting a new gas holder of 150,000 cu. ft. capacity in Columbia, at a cost of about $50,000.

"Doing It Better *with* Gas" *in* Panama --*in* Spite *of the* Weather

By H. Elliott Taylor
Associate Editor, Western Gas

¶ WESTERN GAS' staff member, who writes the following dissertation on one of our "far-flung" yet enterprising branches of gas service, recently paid a personal visit to the scene of which he writes—the Panama-Colon Gas Company's territory. Making the voyage from San Francisco to the east coast he halted en route to exchange civilities with S. Paul Vecker, vice-president and general manager of the Panama utility. We offer our readers the result!

THERE is a saying, oft repeated in Central America, that a white man, during his first year in the tropics, just sits and thinks,—after that he just sits—. And as far as the itinerant space writer is concerned, the latter half of this axiom might well apply to the first year as well. For when the thermometer hovers around the roof, and the humidity in the air can almost be taken up with a sponge, the habitual dweller in the temperate zone, transplanted to this new environment, finds little encouragement for even nominal cerebral functioning.

It would appear that there would be little to interest the gas fraternity in Panama, where the word "heat" might be expected to arouse a pronounced anathema in the minds of the populace. But a close-up observation of the Panama-Colon Gas Company—casual as it necessarily was—proved to the writer's complete satisfaction that this conclusion is without foundation. For in this active gas utility, though it operates in a semi-tropical climate—in a country where first charcoal and then kerosene have provided satisfactorily for the minor fuel needs of the district—in cities and environs where every man must be prepared to speak both Spanish and English if he intends to succeed in any line of commercial endeavor —we yet find a company that is a successful and rapidly expanding institution, treading warily and safely the treacherous paths of sales, merchandising and public good will.

A SUCCESSFUL MERCHANT

Merchandising of appliances, that important adjunct to the sale of gas, is here handled in a way that is calculated to place in every home that has the means, the necessary equipment for the use of gas as a fuel. While the company is an active appliance merchandiser, this does not mean that dealers are discouraged or robbed of any sale that might legitimately be theirs. On the contrary, quite the opposite is true. For in these two cities the gas company lends the dealers a sales assistance that is the very acme of cooperation. To any reputable dealer who evinces an interest in the sale of gas appliances the company says in effect: "You may secure your merchandise from us and put it on display, at no cost to yourself. Take your orders and make deliveries, or send the orders to us, and you still make your profit without having been under the necessity of tying any capital up in stock." Sales are then made on either a cash or time-contract basis, with the gas company carrying its own paper if the latter method of purchase is used.

The great distance from the point of manufacture necessitates the carrying of a large and complete stock of parts for all appliances sold; consequently the company has standardized on one make of range, the Roper product. Thus a maximum of service is available to consumers, and at a minimum of overhead expense.

It is a simple matter to use the word "service," too often as a superficial gesture. But it seems to the writer that as far as is humanly possible, that the Panama-Colon Gas Company is actually at the public service. This organization has made itself an indispensible part of the community as well as an integral part of the domestic life of the people that it serves. "Siempre A Sus Ordenes" is written in large letters over the portal, and "At Your Service" is written in large letters in every act of its officers and personnel.

Regular and frequent inspections of every appliance in use is one feature that results in frequent contact with gas users, and forestalls most of the complaints that might arise. But to take care of emergency cases a motorcycle repair service is always in readiness. Salesmen of gas service as well as gas appliances are always at work, covering the towns by districts, "punching doorbells," so that the merits of gas may be ever kept before users and potential users as well.

If there be any one department in which the Panama-Colon Gas Company really shines most brilliantly, it is in its advertising. Institutional advertising, service copy and straight "reason why" appeals are alternated so as to produce a well rounded, balanced and an altogether thoroughly intelligent campaign that many of our larger institutions might well emulate.

A REAL ADVERTISING PROGRAM

In every paper, and every day, there appears copy from the gas company. Two of the daily papers are Spanish, one is English, and this of course calls for copy written in the language to correspond with the paper to be used.

Vice-president Vecker is just a little proud of his advertising, and with good reason. For in the nine years of its existence the company has never found it necessary to advertise gas as a cheap fuel. Discussion of cost has been steadily ignored. Even straight sales arguments, while they are often used, do not by any means form the major portion of the printed advertising matter. The real keynote of the continuous campaign has always been institutional advertising.

National holidays, either Panamanian or American are always strongly featured. Red Cross drives and other outstanding examples of worthy civic endeavor are given recognition. And when the time comes to run straight copy dealing with the company itself, copy of an educational nature is often displayed. One particularly illuminating series was composed of fifteen advertisements on the subject of the manufacture of gas. Every day a special feature was made of one piece of equipment that is in use in the plant.

That the gas copy is being extensively and favorably noticed and commented on was brought out in a most convincing manner some time ago when one of the daily papers conducted a campaign in which they asked their readers to indicate what advertising they read with the greatest interest, and considered the most informative. The Panama-Colon Gas Company was voted first by an overwhelming majority.

A WORD FROM THE PUBLIC

And the effect of all this on public relations? Some months ago it was announced that subscriptions would be taken on one day only for a $70,000 bond issue. On the day following the opening of the books, the public was informed that the issue had been 95 per cent oversubscribed. Small bondholders are encouraged to become partners in this enterprise through the medium of installment selling of bonds.

Much more could probably be said of this thriving public utility, in its picturesque setting in the land of palm trees, and on the location of the greatest engineering project in modern times—our own Panama Canal. But as we bid farewell to friend Vecker on this balmy tropical evening we cannot but reflect that energy and initiative are the same the world over; the only difference lies in the modus operandi. And transplanted thousands of miles we see once more the familiar slogan, grown more significant than ever before, "If it is done with heat, you can do it better with gas."

MORE EXHAUSTER EQUIPMENT INSTALLED FOR P. G. & C. CO.

The Portland Gas & Coke Co. is installing a new centrifugal motor-driven exhauster of 900,000 cubic feet per hour capacity. This unit is a duplicate of two already installed and brings the total exhauster capacity to over 3,000,000 cubic feet per hour. To make room for the new unit a smaller unit is to be removed which will be installed as a booster on the distribution system.

DOHERTY GAS AND OIL BURNER DEVELOPED FOR HOUSE HEATING

In order to make the house-heating load more attractive, Henry L. Doherty & Company have developed a combination gas and oil burner which operates on gas at average temperatures and by thermostatic control is automatically switched to oil fuel when the temperature drops below a given point.

SALLISAW, OKLA., MAY HAVE NATURAL GAS

W. S. Willett has asked for a gas franchise in Sallisaw, Okla., stating that if his request meets approval in the February election to be held on it, the interests he represents would begin at once to secure rights of way for a pipeline from the Gans field, where their wells are located.

BLANCHARD TO SPEAK BEFORE COLORADO ADVERTISING SESSION

Frank Leroy Blanchard, director of the Advertising and News Department, Henry L. Doherty & Company, and president of the Public Utilities Advertising Association, spoke before the fifth annual convention of the 11th district, International Advertising Association to be held at Greeley, Colo., February 25 and 26.

A. G. A. ADVERTISING IS NOW AVAILABLE TO COMPANIES

In the interests of the sale of flexible gas tubing and ranges which are entitled to bear the Blue Star Seal of the Testing Laboratory, the American Gas Association has prepared the following advertising material available free to its company members: four newspaper advertisements, in either two column or three column width; one window display card; one mailing card; one list of Laboratory-approved appliances. This material may be had by addressing the association.

SEPARATING HYDROCARBONATES IN COAL GAS

Fractional distillation is an essential process in the analysis of gaseous hydrocarbons in coal gas, vapors of gasoline, and various other commercial gases and vapors, because the close similarity of the chemical composition of the hydrocarbons makes chemical analyses unsatisfactory. Fractional distillation has been found especially useful in determining the composition of coal gas in analytical work of the Bureau of Mines, Department of Commerce. A method has been developed in the Bureau's laboratories whereby the individual saturated and unsaturated hydrocarbons in coal gas can be accurately determined. It was found that the boiling point of the different hydrocarbons—methane, ethylene, ethane, propylene, propane, butylene and butane—mostly depends upon the number of carbon atoms contained in a molecule of the substance, and is affected very little by differences in structure and unsaturation. The method involves supplementing the usual Orsat analysis by fractional distillation, and can be applied to very small samples, only 50 to 2000 cubic centimeters of the gas being required.

AMERICAN REFRACTORIES ADDS TO LINES OF MANUFACTURE

According to Fred E. Keeler, president of the American Refractories Company, Los Angeles, several new products are now being manufactured by this organization. "Set-Rite", is an "air-setting" high temperature cement now being made; "JoinTite" is a new "fire-setting" high temperature cement; and "FyreSeal" is a new plastic fire brick. Mr. Keeler owns and operates numerous plants and clay mines in the middle west and on the Pacific Coast, and is very enthusiastic over the outlook for the above products. A pamphlet describing the new lines may be had from the company upon request.

PLEDGE SUPPORT TO CONSERVE GAS AND OIL

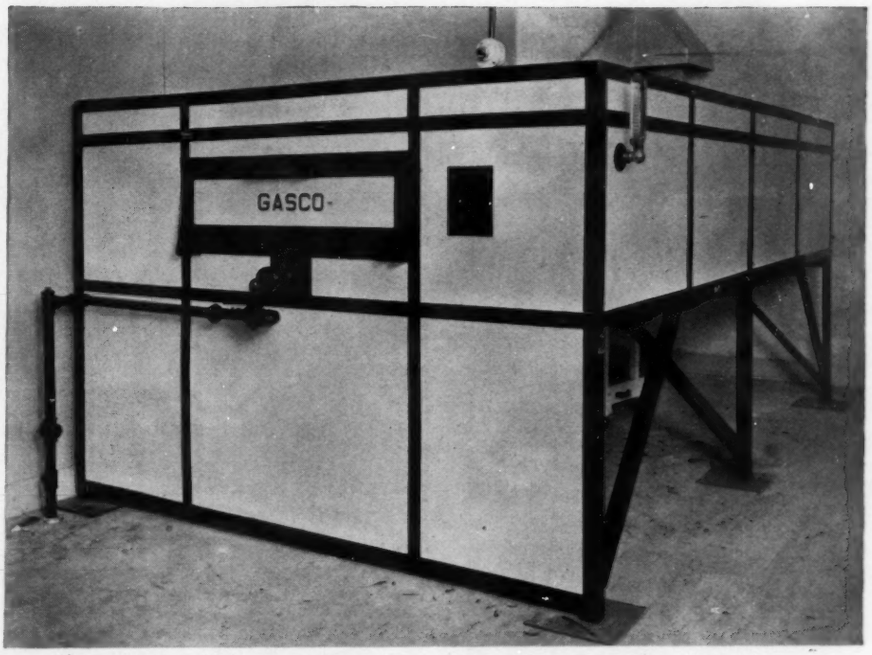
At a special meeting of the Rocky Mountain Oil & Gas Association, held in Casper, Wyo., on February 2, the Association pledged its co-operation with the departments of Commerce and Interior relating to oil and gas operations on the public domain. Support of state agencies which are working for conservation of oil and gas in Wyoming, was also pledged. President B. Brooks appointed a conservation committee consisting of W. L. Connelly, John McFadyen, A. W. Peake, and R. B. Leggett, all of Casper; and A. G. Dana, of Wyoming.

FURNACE ASSOCIATION STAGES ESSAY CONTEST

A contest, open to any employee of a company member, except principals, is being conducted by the Gas Furnace Association of Southern California. Papers not to exceed 500 words in length are being written by contestants, on the subject "What is the Greatest Need of the Furnace Industry?", and the winning author is to receive a $25.00 prize. The idea of the contest came from the three-minute speaking contest staged at the last annual convention of the Pacific Coast Gas Association.

COMPANY MAY ORGANIZE TO PIPE GAS TO WOODWARD, OKLA.

Following gas developments in the Shamrock field of Oklahoma, the Woodward, Okla., Press reports that there is strong liklihood of a local company being formed to pipe gas to that community for domestic use.



Portland Adds Something New *in* Bakery Appliances

The accompanying photograph illustrates a recent installation made in Portland, amounting to a 20-pan capacity bread and pastry oven. This oven was designed by the utilization engineers of the Portland Gas & Coke Company and was built in their own sheet metal shop.

The oven has capacity for 220 one-pound loaves of bread. It is equipped with a composition one-piece deck, measuring approximately 8 feet by 12 feet, and has a full white enamel exterior, and electric interior lights, one valve control, steam pipes and thermostat.

This oven is strictly portable, having been completed in the company shop, up to and including the application of the enamel sides and panels. To facilitate transportation, it was designed and built in two sections, each weighing approximately one ton.

The oven has been operating for about six weeks in a bakery establishment priding itself on high quality goods. Its best recommendation probably is the fact that the bakery owner is now considering enlargement of his building to accommodate a second unit of the same type.

STRICKLER IS MANAGER OF KANSAS CITY GAS COMPANY

Major Thomas J. Strickler, who from 1913 to 1920 was chief engineer for the Kansas Utilities Commission, and who since that date has been with Henry L. Doherty & Co., has been elected vice-president and general manager of the Kansas City Gas Co., succeeding C. W. Green, who recently resigned.

MADERA GAS CO. TO HAVE STOCK ISSUE

Madera Gas Company, Madera, Calif., has been authorized by the State railroad commission to issue and sell at not less than par $12,000 of its common capital stock at $1.00 per share, and to use the proceeds for additions and betterments.

NEW OPERATOR TO SERVE COLONY, KAN.

Gas leases and producing wells of the Teton Syndicate in the Colony field, Kansas, have been purchased by Walter Fees, of Iola. He will continue to serve Colony through the compressor plant in the Colony field. Prices for domestic gas in Colony remain at 45 cents per thousand cubic feet.

SOUTH TEXAS PIPELINE

A new gas pipe line has been projected for the South Texas area. It will be built from the Laredo gas territory to the lower Rio Grande Valley by interests connected with the Mexican Seaboard Company.

MOUNTAIN STATES GASOLINE CORP. BUILDS PLANT

Twenty-eight miles southeast of Trinidad, Colo., the Mountain States Gasoline Corp., controlled by Barnhart Bros., of Denver, is building a 6,000-gallon daily capacity gasoline recovery plant which will be in operation about the middle of March. Gas from the company's wells in San Francisco canon will be treated, its content running about three gallons to the thousand cubic feet. The first well of the group was drilled 31 years ago, and has been flowing wet gas ever since.

DOUGLAS REPRESENTS ICE-O-LATOR ON COAST

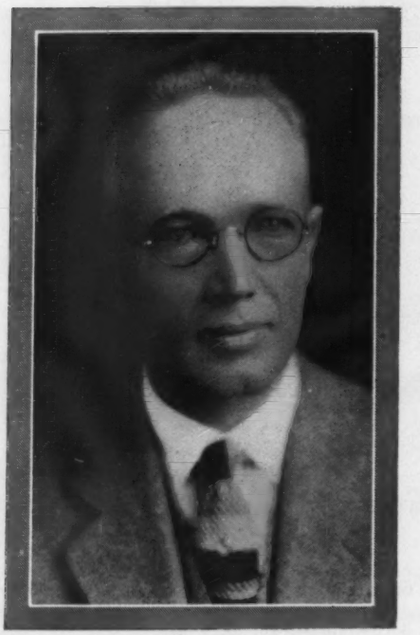
John C. Douglas has been appointed Pacific Coast representative for the Ice-O-Lator, an absorption type electric and gas-operated refrigerator built by the National Refrigerator Company, New Haven, Conn. Mr. Douglas is well known in the specialty trade along the Pacific Coast, and has been closely associated in selling to the public utility companies for the past ten years.

TRADER OIL CO. ASKS PERMIT TO SERVE COLORADO TOWNS

Trader Oil Co., has applied to serve natural gas to Alamosa and Monte Vista, communities of Colorado, the company expecting to get its gas from proven fields eight miles north of Alamosa and 15 miles east of Monte Vista.

The Effect *of* Gasoline Extraction *on the* Fuel Value *of* Natural Gas

By HENRY N. WADE



Henry N. Wade

THE question has often been asked as to how much the extraction of gasoline vapor by "natural gasoline" plants affects the fuel value of the gas. We submit analysis of the reasons for the known fact that the reduction in heating value is very small in most cases.

NATURAL GASOLINE PLANTS ESSENTIAL TO UTILIZATION OF NATURAL GAS

Regardless of the effect on heating value of the gas, the operation of natural or "casinghead" gasoline plants is essential to the practical utilization of the gas. The gas as it comes from the wells contains a considerable proportion of gasoline vapors. Since the gas must be compressed, often to high pressures, for transmission and distribution, this gasoline vapor would, if not extracted, condense to a liquid after compression and cause endless trouble in the distillation system. Such trouble was actually experienced in the early days of natural gas utilization in this district. Even where gasoline plants treated the gas, they were so inefficient that considerable amounts of gasoline got past them, and necessitated the installation of expensive drips in the transmission lines to keep liquid out of consumer's lines.

EFFECT OF GASOLINE EXTRACTION ON FUEL VALUE

As is generally known, our raw natural gas is largely made up of the paraffin hydrocarbons, beginning with the simplest, methane, or "marsh gas" which is a fixed gas, and going on down through the series to heptane, which is a liquid having a boiling point of 209° F. with traces of vapors of still heavier members of the series. The lightest member, methane, usually constitutes eighty per cent or more of the total volume of the natural gas as it comes from the well.

Pure methane has a fuel value of 1008.5 B.t.u. per cu. ft. The natural gasoline fractions, consisting largely of butane, pentane, hexane and heptane, have a heating value of about 4,500 B.t.u. per cu. ft. of vapor. The average of the natural gasoline constituents have a vapor volume of about 27 cu. ft. per gallon of liquid. From these facts it is easy to calculate the theoretical effect of gasoline extraction on the fuel value of the original raw gas as follows:

Assume that the gasoline content of the raw gas is two gallons per thousand cubic feet, which is about the average at present for the state of California. Then about 54 cu. ft. out of the 1000 will be gasoline vapor having a heating value of 4500 B.t.u. per cu. ft., and the remaining 946 cu. ft. will be a mixture of methane, ethane and propane with some inert gases like carbon dioxide, nitrogen, etc., with a combined heating value of about 1100 B.t.u. per cu. ft. Then the total fuel value of raw gas will be

Gasoline vapor 54 cu. ft.x4500= 243,000 B.t.u.
Dry gas .....946 cu. ft.x1100=1,040,600 B.t.u.

Total .....1000 cu. ft. =1,283,600 B.t.u.

That is, the fuel value of the raw or wet gas is 1,283.6 B.t.u. per cu. ft., whereas the residual dry gas from the plant after extraction of the gasoline vapor will be 1,100 B.t.u., a reduction in heating value of only 14 per cent. Of course, if the gasoline content of a particular source of wet gas is less than the figure assumed, the difference in fuel value will be less, and vice versa.

Actual test figures taken from several California plants by the writer check the above method of calculation with very fair accuracy.

CALESTOCO GASOLINE PLANT

The Calestoco Gasoline Company will build a natural gasoline plant at Huntington Beach, Southern California, which will handle 9,000,000 feet of gas daily, from which approximately 8,500 gallons of gasoline will be extracted.

TO STUDY SPECIFICATIONS OF NATURAL GASOLINE

The specifications committee of the Association of Natural Gasoline Manufacturers will make a study of the present trend of manufacturing in the industry to determine whether any changes in present standard specifications are desirable, it was announced recently.

TO MOVE EXECUTIVE OFFICES FROM CHEYENNE TO PARCO

Executive offices of the Prairie Oil and Gas Co. are to be moved from Cheyenne, Wyo., to Parco, Wyo., this spring.

SEMINOLE PLANT COMPLETED BY TULSA-SINCLAIR

Tulsa-Sinclair Oil & Gas Co., expected to have its natural gasoline plant in the Seminole field in operation about the last of February, with a 60,000-gallon daily capacity. The plant has twelve 170-horse power compressors. Two Type-I Braun units will handle distillation, and Braun coolers are being used. Two Newton absorbers are part of the plant's equipment.

PANHANDLE SECTION IS BIG CENTER FOR GASOLINE PLANTS

By March 1 it appears probable that there will be 41 natural gasoline plants in the Panhandle field capable of handling 437,000,000 cubic feet of gas per day and of producing 432,000 gallons of natural gasoline per day. Six plants are now building in the field. Phillips Petroleum Co. is building three plants. Skelly Oil Co. is building one, Magnolia Petroleum Co. one and Marland Oil Co., one. These plants will have a gas capacity of 88,500,000 cubic feet per day and a gasoline capacity of 106,000 gallons per day. The Atlantic Oil Producing Co. proposes to build a 7,500 gallon semi-portable absorption plant in Gray County.

LIST GASOLINE FIRM'S SHARES ON L. A. EXCHANGE

During the latter part of February, shares of the Standard Engineering Company, Los Angeles natural gasoline operator, were admitted to the trading list of the Los Angeles Stock Exchange. This is the first time approval for listing has been given to a company manufacturing gasoline exclusively. Officers of the company, which is capitalized at $3,000,000.00 are Boyd Hammond, president; Frank Royer, vice-president; Wilbur C. Curtis and M. V. Lytton, secretary and assistant secretary, respectively. The company operates two high pressure absorption plants, one near Newhall, California, and another near Riverside; it also operates a gasoline plant at Casper, Wyoming.

COLUMBIAN GASOLINE CORP. GETS GAS CONTRACT

The Columbian Gasoline Corporation, has contracted for the natural gasoline rights on the gas handled by the Northern Texas Utilities Company in delivering industrial and domestic fuel to consumers at Wichita Falls and intermediate points from Wheeler County section of the Texas Panhandle. The Columbian Carbon Company is building a high pressure absorption plant on the above gas line near Shamrock, Texas, to handle about 40,000,000 cubic feet of gas daily, with a gasoline yield of about one-fourth of a gallon per 1000 cubic feet.

SOUTHWESTERN GAS METER SHORT COURSE—APRIL 5-7

The 1927 Southwestern Gas Meter Short Course, sponsored by the University of Oklahoma, Oklahoma Corporation Commission and Oklahoma Utilities Association, will be held in the engineering building of the University at Norman, April 5, 6 and 7.

The gas meter school committee, of which J. H. Baxter of Oklahoma City is chairman, met February 23 at Norman to make arrangements. The school is an annual event and has grown in importance until more than 250 men of Oklahoma, Kansas, Missouri, Arkansas, Louisiana and Texas attended the school last year.

A new feature will be a session for natural gasoline manufacturers and the Natural Gasoline Manufacturers Association has been consulted relative to what it desires to have on the program. Instruction in measurement of gas in small and large volumes, both at high and low pressure, is given at the meter school. Practically all of the gas companies in the southwest send representatives to this short course. Instruction in the calibration of meter provers, the keeping of meter records and proper installation, maintenance and repair of gas meters is also included. The leading gas meter manufacturers of the United States co-operate in furnishing instructors and equipment for the laboratory and shop work.

WESTCOTT & GREIS L. A. MANAGER MARRIES IN FEBRUARY

G. H. Unkefer, Los Angeles manager for Westcott & Greis, was married to Miss Lyda McDonald of Los Angeles on February 9th. Mr. Unkefer is well known throughout the gas and gasoline industries, both on the Pacific Coast and in the Mid-Continent field where he was associated with several of the major companies as gas engineer before coming to the Coast five years ago.

NATURAL GASOLINE OPERATORS IN BOWLEGS FIELD, OKLAHOMA

In the Lima or Bowlegs field of Oklahoma, often referred to as the 8-6 pool, Indian Territory Illuminating Oil Co. and Empire Gasoline Co. have arranged for a combination of well flowing and portable gasoline plant equipment to handle properties of the two companies in the area. Construction has started on three gasoline plants, one on the Empire's Lacy lease in 14-8-6, one each on the I.T.I.O. Livingston and Davis leases. These last are semi-portable absorption type and are being rushed to completion. The Lacy plant, which will be the main plant, is of the combination compression and absorption type.

MANHATTAN OIL BUILDS NEW GASOLINE PLANT IN KANSAS

A second gasoline plant has been built, at an approximate cost of $150,000, by the Manhattan Oil Co. on the Damalorie-Souder lease in Greenwood County, Kan., raising the company's production to 13,000 gallons a day. Ralph Wyrick is manager of both plants.

MINING AND METALLURGICAL ENGINEERS MEET

The American Institute of Mining and Metallurgical Engineers announces that the 135th meeting of the Institute will take place Feb. 14-17 in New York City. The program will include discussion of the following subjects: The Economic Trend of the Gasoline Situation, by Barnabas Bryan Jr., Consulting Economist, New Yory City; The Economics of the Casinghead Gasoline Industry, by J. R. Hopkins.

MOFFAT COUNTY GASSERS

Marland Oil Company's Taylor No. 1, on the Iles Structure, Moffat County, Colo., is now flowing at the rate of 25,000,000 cu. ft. daily. This is the fourth gasser to be brought in in this region in the past four years. The other three are sealed, awaiting some use for the gas. No appreciable gasoline content is found in the Moffat county gas.

118 GAS WELLS IN 1926 RECORD FOR SOUTH TEXAS

Completion of 118 natural gas wells in 1926, brought the open flow of the south Texas area to 2,900,000,000 cubic feet, making it one of the largest developed gas districts in the world, says a survey by G. E. Barrett & Co.; the open flow of the Laredo territory is placed at 2,000,000,000 cubic feet.

NATURAL GAS GASOLINE OPERATIONS

Compiled by E. T. Knudsen

Department of Commerce, Bureau of Mines, Division of Mineral Resources and Statistics

ONE HUNDRED and fifty natural gas gasoline plants with a daily indicated capacity of 1,326,481 thousand cubic feet, report a recovery of 40,323,680 gallons of natural gas gasoline from 28,523,595 thousand cubic feet of gas treated in January. This in an increase of 418 barrels in daily average production.

Utilization of natural-gas gasoline amounted to 909,882 barrels, an increase over December of 621 barrels. Daily average utilization of 29,351 barrels was 1,620 barrels less than daily average production of 30,971 barrels.

Stocks of natural-gas gasoline at the end of January amounted to 368,635 barrels of which 33,226 barrels were reported by natural-gas gasoline plant operators and 335,409 barrels by refinery operators. This is an increase of 50,206 barrels over December stocks. This stock figure of 368,635 barrels is approximately twelve and one-half days supply at the current rate of consumption.

Production of gasoline during the month of January amounted to 4,908,997 barrels, a daily average of 158,355 barrels. This is an increase of 148,567 barrels or 3.12 per cent over the December output and an increase of 1,059,293 barrels or 27.52 per cent over the output of January 1926.

Of the gasoline produced 4,483 barrels were reported as finished gasoline produced by natural-gas gasoline plant operators. Production of gasoline from Cracking Processes decreased in January to 344,790 barrels.

Stocks of gasoline show an increase of 1,696,219 barrels during January and at the end of the month amounted to 12,292,559 barrels. This stock figure includes 81 barrels of finished gasoline reported by natural-gas gasoline plant operators.

CALIFORNIA NATURAL-GAS GASOLINE PRODUCTION, DISTRIBUTION AND STOCKS
January, 1927

PRODUCTION

Type of Plant	*Gas Treated M. C. F.*	*Natural-gas Gasoline Produced Gallons*	*Gasoline Recovery per MCF Gas Treated*
Oil Absorption	12,418,276	18,593,034	1.497 Gal.
Compressor	315,576	510,275	1.617 "
Combination Comp. and Oil Absorption	9,037,186	14,353,409	1.588 "
Combination Oil and Charcoal Absorption	5,688,584	6,647,263	1.169 "
Charcoal Absorption	1,065,973	195,815	.184 "
Drip		23,884	"
TOTALS	28,523,595	40,323,680	1.414
Finished Gasoline produced at plants			4,483 Bbls.

DISTRIBUTION			
Stocks First of Month	Bbls.	318,429	Bbls.
Production during Month	"	960,088	"
Quantity mixed with crude or unfinished oils	344,790 "		
Used in Blending at Refineries	416,644 "		
Stocks end of month	368,635 "		
Used at Plants, Shortage and Evaporation losses	15,739 "		
Balance	132,709 "		
TOTALS	1,278,517 Bbls.	1,278,517	Bbls.

STOCKS				
Natural-gas Gasoline held by Natural-gas Gasoline Plant Operators	1,395,483 Gal.	or	33,226	Bbls.
Natural-gas Gasoline held by Refiners	14,087,178 "	"	335,409	"
TOTALS	15,482,661 Gal.	or	368,635	Bbls.
Finished Gasoline (Motor Fuel) held by Natural-Gas Gasoline Plant Operators			81	Barrels

AHLBURG GASOLINE CO. DRILLS FOR WET GAS AT ANGIOLA

Four miles southwest of Angiola near the shore line of Lake Tulare (now dry), San Joaquin Valley, Calif., the Ahlburg Gasoline Co. is drilling for wet gas. Four abandoned wells in the vicinity were once sensational gassers, before the natural gasoline extraction process was developed to its present stage. It is thought that an absorption plant will be erected, should the new well yield paying quantities of gas.

SATTERWHITE OF TULSA VISITS WEST COAST

J. H. Satterwhite, general manager of Westcott & Greis at Tulsa, Okla., was a visitor on the Coast during February.

NATURAL GASOLINE MEN MEET

Convention dates for the Association of Natural Gasoline Manufacturers are April 19, 20, and 21, the meetings to be held at Tulsa, Okla.

SHELL CO. ADDS TO BREA PLANT

The Shell Company's compressor plant in Brea Canyon, Southern California, is being doubled in capacity and the number of units increased by six. The Brea Canyon casinghead gas is among the richest in the state, yielding about 2½ gallons per 1000 cu. ft.

ROCKY MOUNTAIN NATURAL GAS PRODUCTION

Production of natural gas in the Rocky Mountain region in 1926 has been estimated by Casper, Wyo., statisticians at close to 40,000,000,000 cubic feet.

DECEMBER NATURAL GASOLINE PRODUCTION

Natural gasoline production figures for December, 1926, showed a total of 130,184,000 gallons, or a daily average of 4,199,000 gallons, were produced. This is an increase of about one per cent, or 45,000 gallons over the November showing.

This Practice Will Make Company Friends

IN the photograph above is shown the laying of a 16-inch gas line by the Southern California Gas Company on Hill Street between Ninth and Tenth Streets, Los Angeles. This view is presented as illustrative of a development in the handling of earth, which conduces both to convenience and safety.

It will be noted that the use of wooden boxes to receive the dirt allows a lane of traffic to remain open between the ditch and the curb. Where the line runs near a safety zone, the latter is left open by the simple expedient of placing the dirt receptacle on the curb and carrying the dirt to it. This innovation was developed under C. D. Bell, superintendent of distribution for the company.

Cooperation extended the gas company by the Automobile Club of Southern California in posting the boxes—promptly and free of charge—received highly favorable comment, in connection with the new practice.

PITTSBURGH METER OFFICIAL RESIGNS AS MANAGER

A. G. Holmes, for almost 30 years vice-president and manager of the Pittsburgh Meter Company, Pittsburgh, Pa., resigned as manager on January 1. Hr. Holmes was widely known in the gas industry, and for the past ten years was a familiar figure at all Pacific Coast Gas Association conventions. He retains his connection with the company as vice-president.

T. C. Clifford, sales manager of the company for over 20 years, was elected manager of the company to succeed Mr. Holmes, and H. I. Beardsley, who has been district manager of the Chicago office for a number of years, has succeeded Mr. Clifford as sales manager.

J. E. Brown, for several years advertising manager and assistant to the sales manager, has been transferred to Chicago and appointed district manager of that office.

100TH ANNIVERSARY OF FIRST MANUFACTURED GAS PLANT

February 5 was the one hundred and tenth anniversary of the incorporation of the first manufactured gas company to be established in the United States. On February 5, 1817, the Gas Light Company of Baltimore, Md., came into official existence.

It was in 1816 that the Baltimore city council passed an ordinance permitting Rembrandt Peale, of portrait fame, to manufacture gas, lay pipes and contract for street lighting in Baltimore. It was not until the next year, however, that the company was incorporated.

Today, according to the American Gas Association, the gas industry serves 52,000,000 persons through 87,000 miles of gas mains and nearly 11,000,000 meters. Sales of gas for 1926 reached the record-breaking total of 459 billion cubic feet.

MID-WEST GAS CO. ENGAGED IN SHALE GAS DRILLING

W. J. Schoonmaker, vice-president of the Mid-West Gas Co. of Tulsa, announces that his company has under way an intensive drilling campaign in the shale fields in the vicinity of Chanute, Kan., in order to increase its gas reserves. The Mid-West Gas Co. is a $2,500,000 enterprise, representing a merger of interests in Kansas and Oklahoma, effected last December 9. Kansas headquarters are at Neodesha. The company's territory takes in 23 towns in the two states named, most of the business being wholesale to industrial consumers, and to companies holding franchises for gas service in various communities. The company's pipeline system is 292 miles in length.

LINE FROM SACRAMENTO TO ROOSEVELT, CALIF.

On February 4 the California railroad commission authorized the Pacific Gas and Electric Co. to construct a high pressure gas line from Sacramento to Roosevelt, Placer county, to supply Roosevelt and territory between that city and Sacramento. The Roosevelt gas plant will cease operation.

LINE FROM MIRANDO FIELD TO LOWER RIO GRANDE VALLEY

Rio Grande Gas Co., San Benito, Texas, has let a contract to Hope Engineering & Construction Co. to construct a natural gas line from Mirando Field, 40 miles north of Laredo to Lower Rio Grande Valley Cities.

HOME ACCIDENTS STUDIED BY NATIONAL SAFETY COUNCIL

Stating that human and economic losses from home accidents are practically comparable to those from industrial or traffic accidents, the National Safety Council has appointed a special committee to thoroughly investigate the home safety problem.

CONGRESS MAKES HELIUM APPROPRIATION

Congress has allowed an appropriation of $500,000 for the acquisition of helium bearing gas lands. In addition, an appropriation of $563,000 has been made available by the same bill for the purchase, lease, construction or modification of plants, pipelines accessories, compressor stations, camp buildings and other facilities for the production, transportation, storage and purification of helium and helium bearing gas.

PAVILION, WYO., LOOKS TO MANUFACTURED GAS

Manufactured gas service for Pavilion, Wyo., looms as a development of the not-far-distant future, according to Robert I. Thompson, general manager of the Pavilion Natural Gas Company, which operates 41 gas wells to serve Pavilion and other communities in this section. A new gas plant is being erected at Pavilion as the company's gas supplies dwindle.

NEW HOSPITAL INSTALLS GAS FIRED KITCHEN EQUIPMENT

Kitchen equipment in the Good Samaritan Hospital, Los Angeles, will be gas-fired. A five-section French type hotel range, manufactured by the Madsen Iron Works of Los Angeles, is being installed, each section being fitted with a new syphon burner which is intended to effect considerable fuel economies.

SOUTHERN COUNTIES TO START EMPLOYEE PUBLICATION

Beginning early in March the Southern Counties Gas Company will issue a four-page monthly publication to its employees, of which there are in the neighborhood of 1000. Lawrence Raymond, of the utility's advertising department will edit the employee paper.

SALINA SERVICE TO BEGIN ABOUT OCTOBER 1

According to C. A. Leland, who was recently appointed manager of the United Power & Light Corporation, the town of Salina, Kan., may look for natural gas service by about October 1, when the company's pipe line from the McPherson-Lindsborg field is expected to be complete. The pipe line project is costing approximately $225,000.00.

APPLY TO SERVE GAS TO SOUTH CANON, COLO.

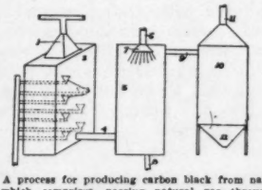
The Continental Oil Company, drilling southeast of Canon City, Colo., has encountered a considerable gas flow. Petition has been made by officials of the company for a franchise to serve gas for domestic use in South Canon, a municipality on the outskirts of Canon City.

1927 ROAD BINDER OUTPUT ALL CONTRACTED FOR

A contract for approximately 250,000 gallons of road binder has been entered into with Multnomah County, Oregon, by the Portland Gas & Coke Co. This together with contract for Oregon State Highway Commission and other orders from smaller consumers absorbs the output for 1927. Much interest is being displayed by the motorists of the State of Washington in Oregon's successful use of surface treatment of macadam roads. Oregon now has many miles of smooth dustless highways in sections where travel is insufficient to warrant the high cost of paving. It has been demonstrated that for all but the most heavily travelled roads surface treatment may be applied and maintained for less cost per mile per year than the interest charges alone on concrete or asphalt paving.

THIS MONTH'S PATENTS PERTAINING TO THE INDUSTRY

1,614,685. PROCESS FOR PRODUCING CARBON BLACK FROM NATURAL GAS. EDWARD B. PARSONS and WILLIAM D. INSKEEP, San Francisco, Calif., and WILLIAM HUNT, Baltimore, Md. Filed May 19, 1925 Serial No. 31,422. 7 Claims. (Cl. 134—60.)



1. A process for producing carbon black from natural gas which comprises, passing natural gas through a flame and thereby liberating the carbon from the natural gas, spraying the same with an aqueous solution, and collecting the carbon.

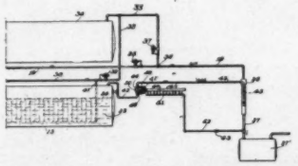
1,610,399. METHOD OF MANUFACTURING HIGHLY-ACTIVE CARBON. EDOUARD URBAIN, Paris, France, assignor to Urbain Corporation, a Corporation of Delaware. Filed Mar. 29, 1926. Serial No. 98,376. 11 Claims. (Cl. 252—3.)

1. The process of manufacturing active carbon which comprises the steps of impregnating cellulosic material with a substance of acid reaction comprising oxygen and phosphorus in chemical combination, and thereafter heating the material above 700° C. and until there is a substantial evolution of phosphides

1,616,192. UNBURNED REFRACTORY BRICK AND METHOD OF MAKING IT. AUGUST MARKS, Carteret, N. J., assignor to United States Metals Refining Company, Middlesex County, N. J., a Corporation of New Jersey. Filed May 6, 1926. Serial No. 107,307. 13 Claims. (Cl. 25—156.)

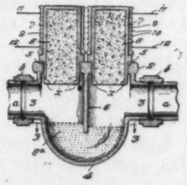
1. An unburned magnesite brick or like refractory composed of a magnesitic body material which has been mixed with a suitable siccative oil, molded and dried to hardness.

1,610,685. APPARATUS FOR PRODUCING ARTIFICIAL GAS. ARTHUR N KERR, Bellevue, Pa., assignor to Rockgas Products Company, Coraopolis, Pa., a Corporation of Delaware. Filed June 4, 1924 Serial No. 717,779. 6 Claims. (Cl 48—144.)



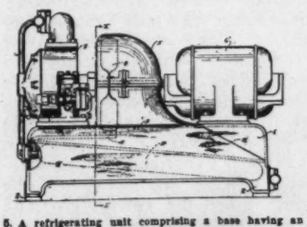
1. An apparatus for producing carburetted air gas of substantially uniform calorific value comprising in combination a service air storage tank, a carburetting tank for producing carburetted gas, a gas mixer, conduits leading from the said service tank to the carburetting tank and mixer, respectively, a conduit connecting the carburetting tank and mixer, a valve interposed in the pipe from the carburetting tank to the mixer, and means for controlling the actuation of said valve in response to the calorific value of the gas produced in the mixer

1,616,419. AUTOMATIC SHUT-OFF DEVICE FOR GAS IN CASE OF FIRE. WYLIE GEMMEL WILSON, Elizabeth, N. J., assignor to Everlasting Valve Company, Jersey City, N. J., a Corporation of New Jersey. Filed Apr. 3, 1925. Serial No. 20,454. 4 Claims. (Cl. 137—162.)



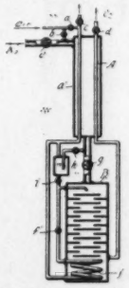
4. The combination with a gas conduit member formed with a gas-way and a chambered holder containing a mass of fusible metal exposed to and spaced apart from and above the gas-way; the gas-way being formed to receive the fusible metal when melted and thereby seal the gas-way against flow of gas through the gas-way; a heat resisting electric resistance coil support and said coil for raising, at the will of an operator, the temperature of said coil to a degree sufficient to melt the fusible metal, the coil support being mounted on said holder and the coil surrounding the support and the support surrounding the holder

1,613,600. COOLING DEVICE FOR COMPRESSORS AND CONDENSERS. ROBERT L. ALEXANDER, WILLIAM WISHART, and HARRY H. WATERS, Clinton, Iowa, assignors to Climax Engineering Co., Clinton, Iowa, a Corporation of Delaware. Filed Dec. 2, 1925. Serial No. 72,725 7 Claims. (Cl. 62—115.)



5. A refrigerating unit comprising a base having an opening therein, a condenser mounted therein, a compressor mounted on said base, a fan on said base above said opening, and a driving means for said compressor adapted to operate the fan to cause cooling of the condenser and said compressor.

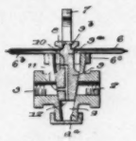
1,615,597. METHOD FOR LOW-TEMPERATURE COOLING, LIQUEFACTION, AND SEPARATION OF GASES. ARTHUR SELIGMANN, Bremen, Germany. Filed Mar. 3, 1924, Serial No. 696,596, and in Germany May 26, 1922 2 Claims. (Cl. 183—115.)



1. A method of low temperature cooling, liquefaction and separation of gases, which consists in causing the gases to flow through a countercurrent heat exchanging apparatus and to increase the rate of speed upon starting the process beyond the rate of speed of the flow maintained during the normal performance of the process

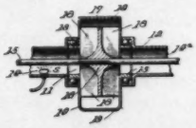
1,615,776. SAFETY CUT-OFF DEVICE FOR GAS SERVICE. WALTER GAY SLATER, Dodge City, Kans. Filed Oct. 10, 1923. Serial No. 667,764 2 Claims (Cl. 67—115.)

1. A safety cut off device for gas lines comprising a valve casing having a central chamber or bore, a plug reciprocating therein to open and close the valve, inlet and outlet ports opening into said bore in alignment with each other below the lower end of the plug when in open position, and an expansible gas chamber composed of a pair of resilient discs, peripherally connected, the lower one centrally perforated and secured gas tight to the valve casing and the upper one secured to said plug



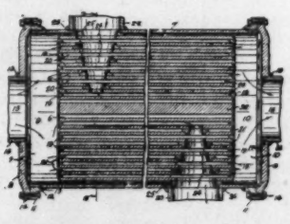
through the central perforation in the other, said plug being provided with means to vent said gas chamber when in its closed position.

1,610,668 APPARATUS FOR SEPARATING IMPURITIES FROM GAS. JOHN R. FREEMAN, Providence, R. I. Filed May. 18, 1921 Serial No. 453,336. 6 Claims (Cl 183—77.)



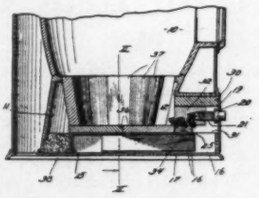
1. An apparatus for purifying gas comprising a casing with side and peripheral walls, a rotary shaft extending axially of the casing, a gas impelling device mounted to rotate with the shaft comprising a partition perpendicular to the shaft and joining the shaft at each side in a smooth, tangential curve and lateral vanes extending from the partition and forming therewith compartments, an axial inlet opening through one side wall and an axial outlet opening through the other side wall, a continuously open discharge opening through the peripheral wall to permit the discharge of the heavy constituents of the gas separated therefrom by centrifugal action, inlet and outlet gas conduits surrounding the shaft and communicating with the casing at said axial openings, the curvature of the partition and the areas of the inlet and outlet conduits and openings being such as not materially to impede the constant flow of the gas through the casing determined by the area of the passageway therethrough.

1,615,658. HEAT EXCHANGER. ROBERT L. SHIPMAN, Bridgeport, Conn., assignor of one-half to Earl D. Sprague, Bridgeport, Conn. Filed May 22, 1926. Serial No. 116,925. 3 Claims. (Cl. 257—243.)



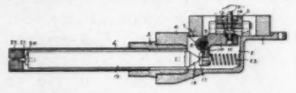
1. In a heat exchange device, an outer tubular shell, a plurality of spaced concentric tubes within the shell and spaced therefrom and providing chambers at the opposite ends of said tubes, the alternate spaces between the tubes being in communication with said chambers and the remaining spaces being out of communication with said chambers, laterally extending fluid inlet and outlet connections to the latter spaces comprising pipes connected to the shell and openings in the tubular members in alignment with said pipes progressively decreasing in diameter toward the inner tube and welded connections between alternate adjacent tubes about said openings cutting off communication of said openings with the first mentioned spaces, and fluid inlet and outlet connections to said chambers.

1,610,229. GAS-BURNING HEATER. HARRY A. ATWATER, Kansas City, Mo. Filed Feb. 18, 1924. Serial No. 693,545. 3 Claims. (Cl. 158—117.5.)



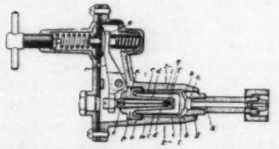
3. The process of producing combustion of a hydrocarbon gas within a heater which consists in heating air for supporting the combustion by conducting it past exterior surfaces of the heater maintained hot by heat transmitted from the combustion chamber of the heater, conducting said air into the combustion chamber of the heater, feeding the pure hydrocarbon gas, unmixed with air, in a steady unturbulent stream of comparatively low velocity and of substantial depth and in sheet form spreading out over the interior surfaces of said chamber, and thereby igniting and burning said gas first at the exterior of the gas stream and by the heat thus generated and also reflected and radiated from said interior surfaces of the chamber breaking down the gas at the interior of the stream into its components and producing the principal heating action by the combustion of said components

1,610,887. THERMOSTATIC CONTROLLER FOR GAS WATER HEATERS. BERNARD RYAN, New York, N. Y. Filed June 7, 1924. Serial No. 718,519. 6 Claims. (Cl. 236—33.)



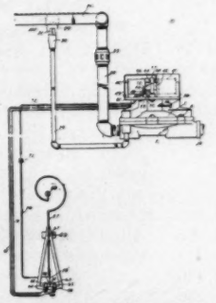
1. In a thermostatic control for gas water heaters, the combination with the main gas control lever operating on a fixed pivot, of a horizontally disposed thermostat having a suspended rod, a single bell-crank lever mounted on a fixed pivot and pivotally engaging one end of said thermostat rod and slidably engaging said main gas control lever

1,615,562. SPOUT FOR DELIVERING GAS UNDER PRESSURE. MICHAEL ZACK, Cologne-on-the-Rhine, Germany. Filed Oct. 2, 1925. Serial No. 60,129, and in Germany Nov. 26, 1923. 4 Claims. (Cl. 62—92.)



1. In a nozzle for delivering compressed gas, an inlet, an outlet, a plurality of concentrically arranged chambers interposed between said inlet and said outlet, each of said chambers communicating at one end with one of said chambers, and at its opposite end with another of said chambers, whereby the gas is caused to follow a tortuous course.

1,614,802. ELECTRICALLY CONTROLLED VALVE FOR GAS BURNERS, ETC. EL ROY L. PAYNE, Los Angeles, Calif., assignor to Payne Furnace and Supply Company, Los Angeles, Calif., a Corporation of California. Filed Sept. 29, 1924. Serial No. 740,559. 5 Claims. (Cl. 236—84.)

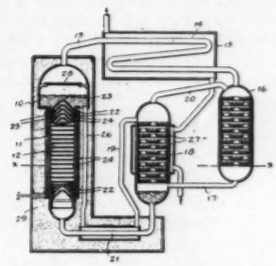


1. In combination with a gas burner provided with a pilot burner, a valve for controlling admission of gas to said gas burner and said pilot burner comprising a valve casing provided with inlet passage means and with outlet passage means connected to said burner, diaphragm valve means controlling communication between said inlet and outlet passages and adapted to be opened by the pressure in said inlet passage, a pressure chamber at the opposite side of said diaphragm valve from said inlet passage, means for conducting gas from said inlet passage to said pressure chamber, means for conducting gas from said pressure chamber to said pilot burner, open passage means establishing communication at all times between said inlet passage and said pilot burner for maintaining a small flame at said pilot burner, and auxiliary valve means controlling communication between said inlet passage and said pressure chamber and between said pressure chamber and said pilot burner in such manner that communication between the pressure chamber and the pilot burner is established simultaneously with shutting off the communication between the inlet passage and the pressure chamber, thereby effecting release of pressure in said pressure chamber and permitting the

1,610,889. GAS-REGULATING DEVICE. GUSTAVE F. SCHMIDT, Chicago, Ill. Filed Oct. 22, 1923. Serial No. 669,939. 1 Claim. (Cl. 67—121.)

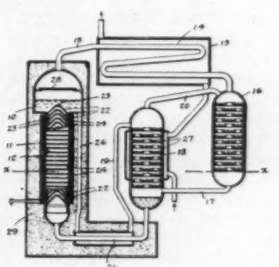
A gas regulating device comprising a cylindrical member of equal diameter throughout and provided with a uniform bore terminating adjacent to one end whereby relatively thick side walls and one end wall are provided, a minute central opening in said end wall communicating with the bore and of smaller diameter than the diameter of the bore, said end of the member being provided with an external bevel of length less than the thickness of said end wall, the member being provided with slits radiating from the bore and said minute opening.

1,613,627. REFRIGERATOR. BALTHAR CARL VON PLATEN and CARL GEORG MUNTERS, Stockholm, Sweden, assignors, by mesne assignments, to Electrolux Servel Corporation, a Corporation of Delaware. Filed Nov. 21, 1925, Serial No. 70,648, and in Sweden May 3, 1924. Renewed Nov. 5, 1926. 5 Claims. (Cl. 62—119.)



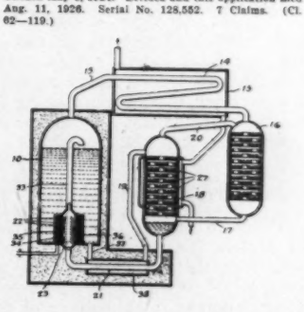
2. A refrigerator comprising a generator, a condenser, an evaporator, an absorber, means to conduct liquid from the generator to the absorber, means to conduct liquid from the absorber to the generator, and a series of elements in said generator forming a central passageway, and a series of pockets surrounding said passage way and extending upwardly and obliquely with respect to and opening into said central passage way and means to heat the lower ends of said pockets.

1,613,626. REFRIGERATOR. BALTHAR CARL VON PLATEN and CARL GEORG MUNTERS, Stockholm, Sweden, assignors to Electrolux Servel Corporation, New York, N. Y., a Corporation of Delaware. Original application filed Nov. 21, 1925, Serial No. 70,648, and in Sweden May 3, 1924. Divided and this application filed June 5, 1926. Serial No. 113,910. 4 Claims. (Cl. 62—119.)



1. A refrigerator comprising a generator, a condenser, an evaporator, an absorber, a conduit extending between said absorber and said generator, means to conduct liquid from said generator to said absorber, a channel forming part of said conduit and a series of pockets placed obliquely with respect to said channel and opening therefrom in direction of flow toward said generator and means to apply heat to said pockets.

1,613,629. REFRIGERATION. BALTHAR CARL VON PLATEN and CARL GEORG MUNTERS, Stockholm, Sweden, assignors, by mesne assignments, to Electrolux Servel Corporation, a Corporation of Delaware. Original application filed Nov. 21, 1925, Serial No. 70,648, and in Sweden May 3, 1924. Divided and this application filed Aug. 11, 1926. Serial No. 128,552. 7 Claims. (Cl. 62—119.)



1. Refrigerating apparatus comprising a generator, an evaporator, an absorber, a conduit extending between said absorber and said generator, an enlarged portion in said conduit, a series of pockets in said enlarged portion, an electric heating element surrounding said portion and means to conduct liquid from the generator to the absorber

Education Will Produce Maintenance Economies *in* Motor Truck Operation

By E. C. Wood

Division Superintendent of Transportation, Pacific Gas and Electric Company, San Francisco

A MOTOR truck is purchased in the first place to save money, and from the moment it becomes part of the transportation system of a concern it must earn money. It must not merely supplant horse-drawn equipment of the same capacity; it must do more work than the horse equipment did, and at a lower cost. It has only been in recent years that the motor truck operator has come to realize the importance of educating his truck drivers, because it is known that the more the driver knows about his truck, both with respect to its mechanism and method of handling, the more efficiently will the truck be operated and the more money it will make for its owner.

MAINTENANCE ROUTINE NECESSARY

The motor truck owner cannot expect the driver himself to outline his own plan of action. The driver must receive his instructions from the owner of the truck or the man in charge of the transportation department. Of course, there are a great many items which the driver himself is able to learn, but the routine of truck care must be set down by the owner and fulfilled by the driver. Many truck installations have failed utterly because the owner supposes the driver to understand everything about the truck. While the factory supplies a certain amount of information in its instruction books, the average instruction book is not so clear to the driver that he can from day to day attend to the necessary matters. It is, therefore, up to the owner to give definite instructions on daily, weekly and monthly maintenance. In this maintenance routine the owner will find two items of utmost importance—these are lubrication and adjustments, with the first named the more important.

It can readily be seen that if every moving part were properly lubricated all the time wear would be reduced to a minimum. How many truck operators know for certainty that steering knuckle pins are given their required amount of lubrication every day? How many owners are sure that universals are repacked with fresh graphite and grease every thousand miles or so, depending on the truck? A clutch thrust bearing and throw-out collar are important parts that require daily attention. Every truck, of course, is not like every other truck mechanically; therefore certain instructions will apply to one but will not apply to another, but in general the following parts should be attended to daily:

PARTS NEEDING DAILY CARE

Fan bearing, all steering joints from knuckles to the post, all spring bolts, clutch throw-out collar, all fast moving parts that are not enclosed. Aside from lubrication, the brake linkage should be checked up, the important nuts and bolts tightened, wiring terminals tightened and perhaps cleaned, and a general inspection of the entire truck made. The owners should bear in mind that this sort of inspection, which means money to them in the end, will require a little time.

The owner will find that the parts, if lubricated weekly, will give much longer service than if permitted to run for many thousands of miles without attention. It is not the usual thing to say that the wheel bearings should be attended to each week, but these important parts must be constantly lubricated and a weekly inspection insures that. The ignition unit, if it happens to be magneto, should have its armature bearings oiled slightly. In addition, the weekly inspection should include a tightening up of such parts as spring clips, adjustment of brakes, inspection of tires, and so forth. The actual work will depend largely on the specific vehicle. Every month the truck should be gone over completely and every point of lubrication inspected and every part likely to come loose tightened. I do not say that every operator who observes the precautions set down in the foregoing will get 300,000 miles from his car, but I feel safe in saying that he will lengthen its life beyond expectation.

ASK FRANCHISES TO SERVE SEATTLE AND TACOMA

Interests represented by Walter Metzenbaum, an attorney of Seattle, Wash., have applied for a 50-year natural gas franchise to serve Seattle and for another of similar duration to serve Tacoma, Wash.

RECORD JANUARY SENDOUT BY L. A. GAS & ELECTRIC

A new high record of gas sendout for the month of January was reported by the Los Angeles Gas & Electric Corp., the figure for January of this year being 2,658,170,000 cu. ft., representing a 20.03 per cent increase over January, 1926.

TEXAS UTILITY TO PIPE NATURAL GAS TO TIPTON

Proposal of the Lone Star Gas Company of Dallas, Texas, to furnish gas to Tipton, was recently approved by the board on behalf of the town. The Community National Gas Company, a subsidiary of the Lone Star company, will install a distribution system in Tipton and a main pipeline will be extended from Frederick for the purpose of supplying the fuel.

PAYNE FURNACE CATALOG

Payne Furnace & Supply Co., Inc., Beverly Hills, Calif., has issued its catalog No. 27-A, which is a very complete piece of warm air heating literature. It contains not only description of design and specifications of the Payne line of furnaces, a line of accessories, and various sales helps, but also reproduces the National Warm Air Heating and Ventilating Association's standard code regulating furnace installation, and the standard installation code of the Gas Furnace Association of Southern California.

KEVIN-SUNBURST GAS MAY SERVE GREAT FALLS

L. C. Stevenson, president of the Sunburst Oil & Refining Company, recently indicated that date has been with H. L. Doherty ing natural gas to Great Falls, Montana, from the Kevin-Sunburst field.

BECOMES CONSULTING ENGINEER FOR H. L. DOHERTY & CO.

Harry D. Hancock, formerly chief engineer of the Gas Service Company, is now consulting engineer on natural gas matters for Henry L. Doherty & Co.

PUBLIC RELATIONS SESSIONS FOR SO-WEST LIGHT & POWER

Snowden M. Hunt, director of public relations for the Southwest Light & Power Company, Oklahoma City, Okla., is conducting a series of public relations meetings throughout the company territory. Meetings will be held on alternate months in the various communities. Those for March will be held at Chickasha, March 21; Duncan, March 22; Lawton, March 23; Altus, March 24, and Elk City, March 25.

1200 ROSEVILLE RESIDENTS SIGN FOR GAS SERVICE

H. M. Cooper, manager of the Pacific Gas and Electric Company's Drum division, announces that 1200 residents of Roseville, Calif., have designated their desire for gas service when the line now being brought from Sacramento is complete. The line will consist of 10,600 feet of 4½-inch main, 8,500 of 3½-inch, and 92,500 of 2-inch, involving a cost of $250,761 for the project.

SIDNEY, MONT., MAY HAVE GAS

Within the next 12 to 18 months, Sidney, Mont., may have natural gas, as a result of a possible pipe line project of the Montana-Dakota Power Company. Surveys are being made looking to the laying of a pipe line from the Cabin Creek field to join the company's line at Glendive, extending 60 miles northwest into Sidney and thence 55 miles farther into Williston, N. D.

OKLAHOMA NATURAL GAS MUST REMAIN IN STATE

According to a ruling of the attorney general of the state of Oklahoma, offered in the case of the Magnolia Gas Co., natural gas which originates in Oklahoma may not be piped out of the state for sale for commercial purposes. A state law to this effect, passed some time ago, does not limit companies engaged in transporting gas out of the state prior to its enactment.

GAS METERS REPLACE FLAT RATE IN OIL COMMUNITIES

Shannon Gas & Electric Co., organized in 1926 to serve residents of oil communities in the Salt Creek field, Wyoming, has installed gas meters throughout its system, due to the waste of gas when a flat rate was used. Gas is purchased by the company from the Midwest Refining Company.

MAGNOLIA LINE TO CARRY THROUGH TO FORT WORTH

The Magnolia Petroleum Company is understood to be planning to carry its newly projected pipeline from Louisiana to Dallas, Texas, on to Fort Worth. The extension from Dallas to Fort Worth will be 18-inch pipe, and will add $600,000 to the cost of the whole transmission enterprise.

THOMAS INSTRUMENTS BRING GOOD RESULTS IN PORTLAND

The Portland Gas & Coke Company has found the Thomas gas meter and calorimeter installed about eighteen months ago very satisfactory. Factory representative visited the company's Works recently and tests were conducted which showed the calorimeter to be accurate and the meter within less than 1 per cent which is within the limits of error in making a holder test. No trouble has been experienced with thermometer and heating elements of the Thomas meter. Since the gas at Portland is scrubbed with absorption oil for benzol recovery, all traces of tar which might stick on these elements is removed.

Gas Distribution Problems Find Unique Solution *In* Honolulu, T. H.

(Continued from Page 26)

afraid of it. Its introduction into this community was only accomplished through a dogged determination of its promoters to "see the thing through."

Today the Honolulu Gas Co., Ltd., has a daily sent out of 1,200,000 cu. ft., while the number of consumers has increased to 11,300.

ALL HIGH PRESSURE

This company has the unique distinction of operating a complete high pressure distribution system. Beginning at the plant with a six-inch main feeder approximately three-quarters of a mile in length, the first main thoroughfare is reached, where the size is reduced to four-inch and thence throughout the city, diminishing gradually as the outskirts of the town are reached until a minimum of one inch is reached.

Pressures at the works vary from four pounds at midnight to thirty-five pounds at the peak load, and these varying pressures are equalized at the consumer's meter by means of individual regulators which reduce the pressures to a constant of four in., giving an exceedingly satisfactory service.

The total main mileage is 120 miles of wrought galvanized pipe, which is laid at a depth of two feet in the main streets while the service laterals are usually three-fourths inch, laid at varying depths from 12 to 18 inches, climatic conditions permitting it.

Unusual conditions prevail here and it will be of interest to enumerate a few of them by way of illustration, while a description of the topography of the island may assist the reader to comprehend the reasons for much that follows.

The island of Oahu on which the city of Honolulu is situated, is traversed from its northwesterly to its southeasterly extremities by a lofty mountain range while from its majestic heights sundry foothills range to the sea, leaving numerous valleys between, and in the seclusion of these valleys the residents have established their homes and developed their estates.

Into these garden spots then, the distribution system of the local gas company finds its way, with numberless "dead ends" and few opportunities for "tie-in," creating a condition unlike that of any other gas company in existence.

ORIGINAL SURVEY METHODS

Add to this, the irregular laying out of the city's highways, which occurred many years before annexation and the ancient practice of the early monarchs in the subdivision of property, which was accomplished by a sweep of the arm in place of our modern surveying system, and you get a very fair idea of some of the unusual conditions mentioned in a preceding paragraph.

However, most disadvantages have their compensations and the condition just described is not an exception, as a glance at the accompanying diagram will disclose, for while the company had many obstacles to overcome, it has one privilege not generally enjoyed by gas companies operating elsewhere.

Prior to the conquest of Kamehameha III, which brought all the islands under his jurisdiction, each island of the group had its own ruler, who administered to the needs of the inhabitants and he, with his favored chiefs was the law of the land. And it was to these "favorites" that large grants of land, called "kuleanas" were bestowed, in a manner heretofore described.

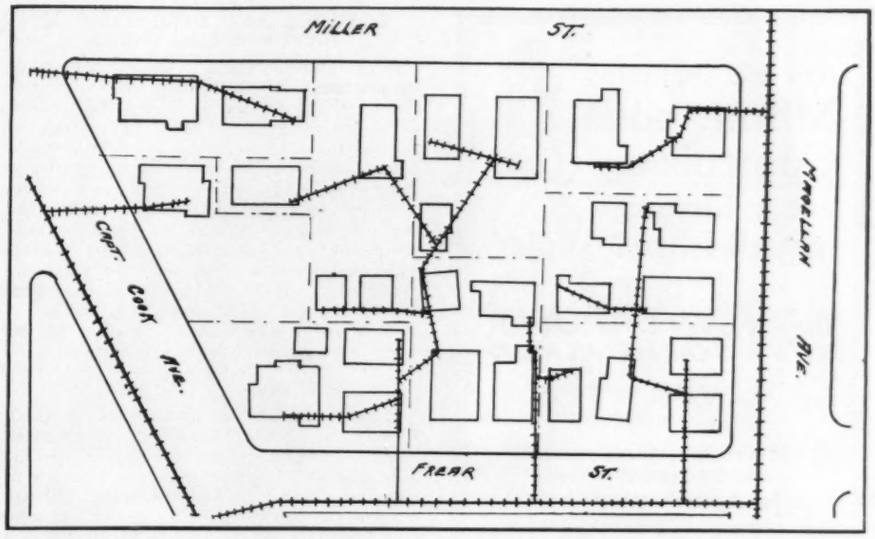


Diagram illustrating the "cross-lots" course of gas service lines in Honolulu. Gas lines are indicated by cross marks

These chiefs in turn subdivided their "kuleanas" among their immediate tribes, each individual landholder erecting a stone wall to mark the metes and bounds of his particular homestead. One may imagine the task confronted by the land court when civilization came to take its place in the islands.

Many of these properties are still in existence, locked in the center of a block, with only a "right of way" to the streets, and to these remote places off the beaten path the gas company is requested to extend its service.

AN UNUSUAL PRIVILEGE

Nothing but a complete high pressure system could meet a condition such as the one just described, and it is doubtful whether any mainland community would extend to its public utility the same privilege as that enjoyed by the Honolulu Gas Co., Ltd., i.e., permission to make service extensions over private property without compensation, an illustration of which may be seen in the diagram referred to. Rarely is such permission refused, since the relations of the company with the public is of the friendliest nature and its readiness to serve in time of need has created a bond of everlasting friendship.

The practice of making these service extensions in many instances have been carried to the extreme where a main extension was not warranted, and in these cases the service lines have been extended through an entire block, crossing the street and serving consumers in the adjoining block, while in many places the main feed will be found strapped to the outside of a long building or hung from a permanent awning from whence sundry services lead to the consumers in that locality.

Frosts are unknown here and storms are of such infrequent occurrence as to be almost negligible, the last one of any consequence happening in the year 1921, when the only damage to the distribution system resulted in the snapping of a number of three-fourths inch services, caused by the uprooting of trees. No damage occurred to the main distributing system however.

These then are the "compensating" advantages here, which in a large measure offset the difficulties met with in endeavoring to install a distribution system along recognized lines and in accordance with engineering practice.

PRAGUE, OKLA., CITIZENS TO VOTE ON GAS FRANCHISE

Application of the Garber Gas and Fuel Co. for a franchise to build and operate a gas distribution system in Prague, Okla., will be voted upon by citizens of the community in an election of March 8. The gas would come from the Seminole field and other southern Oklahoma fields under contract with the Empire companies, which would transport the gas from the fields, for distribution by the Garber Gas and Fuel Co.

COAST COUNTIES STOCK ISSUE APPROVED BY COMMISSION

Coast Counties Gas and Electric Company, San Francisco, Calif., has been authorized by the Railroad Commission to issue and sell on or before December 31, 1927, at not less than 94 per cent of par value, $350,000 of its first preferred capital stock, and to use the proceeds to reimburse its treasury and finance additions and betterments.

GAS FOR DRILLING CALLS FOR NEW PIPELINE

Construction of an eight-inch pipeline to supply fuel needs for drilling near Seminole and Earlsboro, Okla., is being carried to completion by the Tri-Cities Gas Company, a subsidiary of the Independent Oil & Gas Company, to connect with the transmission company's developed properties.

VAN VALKENBURGH LEAVES FOR NEW YORK POSITION

J. D. Van Valkenburgh, utilization engineer for the Portland Gas & Coke Company, announces that he is accepting a position with the Research Institute of the Combustion Utilities Corporation in New York City. Mr. Van Valkenburgh, who was originally from New York, leaves a host of business acquaintances and friends on the Pacific Coast, who regret his departure for the East.

Are you including Minneapolis Controls in every heating installation?

The "MINNEAPOLIS" HEAT REGULATOR

The heart of the heating plant

Minneapolis is the proven control. National advertising makes it easy to sell. You are giving your customer the best there is and making additional profit for yourself. This means more satisfaction all around.

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Los Angeles
950 Parker Street
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CONTROL AND OPERATION OF NATURAL GAS WELLS

Information obtained in field studies made by engineers of the petroleum experiment station of the Bureau of Mines, Bartlesville, Oklahoma, indicate that large savings of natural gas can be effected by scientific methods of recording conditions in gas wells, as these methods indicate conclusively where leaks are occurring. Laboratory work on the flow of air, gas and water through sandstone has been completed at this station. This experimental work has been very successful and checks the results of field tests on the control of water in gas wells. A bulletin on the care and operation of gas wells is now in course of preparation.

ADDITIONS AT SEATTLE

Contract has been awarded the U. G. I. Contracting Co., of Philadelphia, to install several additions to the gas plant of the Seattle Lighting Co., Seattle, Wash. Two 9-ft. cone top sets of carburetted water gas apparatus, and two U. G. I. model B automatic controls are included in the new equipment. Two steam turbine driven blower units, of 13,900 cu. ft. of air per minute capacity each, are also to be installed.

SO. CAL. GAS HEADS SEE GAS REFRIGERATION DEMONSTRATION

On February 11, department heads of the Southern California Gas Company were given a demonstration of refrigeration by gas. The company plans to actively merchandise gas-fired refrigerators as soon as they are on production.

STANDARD ENGINEERING CO. ADDS DEPHLEGMATOR EQUIPMENT

Another dephlegmator has been added to the stripper plant of the Standard Engineering Co., located at Newhall, Calif. The plant treats gas from the lines of the Midway Gas Co.

SHELBY, MON., GRANTS FRANCHISE FOR NATURAL GAS SERVICE

Shelby, Mon., has granted a franchise to the Shelby Oil & Natural Gas Company to serve gas for domestic and industrial purposes, and plans are under way for laying a line from the field three miles north of the town.

GAS FOR FLETCHER

Citizens of Fletcher, Okla., by a vote of 181 to 2, on February 15 voted a franchise to the Midwest Gas Company to pipe gas into Fletcher.

NEW GAS LINES LAID IN COMANCHE AND MARLOW

New feeder lines, which will insure an adequate supply of gas for all sections of Comanche, Okla., have been completed by the Southwestern Gas & Fuel Company. The company's crew will now install improvements to the distribution system at Marlow, which will include a new 4-inch main on East Main Street.

CAPE GAS COMPANY EXPANDS

Improvements estimated to cost $40,000 are being made at the gas plant in Cape Girardeau by the Missouri Utilities Company.

TURLOCK GAS CO. SCHOOL OF COOKING ATTRACTS MANY

At its opening session the cooking school conducted in February by the Turlock Gas Company, Turlock, Calif., drew an attendance of 300 women. Miss Lutie Burkholder of the Tappan Stove Company's home service bureau was in charge of the lectures and demonstrations.

A. P. SINCLAIR NOW WITH COAST PAINT FIRM

A. P. Sinclair, recently with the Missouri Paint & Varnish Co., is now with Hill, Hubbell & Co., San Francisco. From him the latter company has secured authority to manufacture and sell L & S Portland Cement Paint, for which line he will direct the distribution.

DOMINION GOVT. APPROVES EXPORTATION OF GAS

Exportation of natural gas into Montana from the Rogers-Reynolds-Imperial well, four and a half miles north of the Canadian boundary, presumably looking to the piping of the gas into Great Falls, Montana, has been authorized by the Dominion government. The Canadian interests behind the proposed pipe line project would deliver the gas to the Great Falls Gas Company for distribution, it is thought.

WOULD ENACT GAS DISTRICT LEGISLATION

Assemblyman Van Bernard of Butte City, Calif., has introduced a measure into the California assembly which would make possible the organization of districts for developing natural gas for use in generating electric power.

LAGUNA BEACH SERVICE TO BEGIN IN MARCH

Southern Counties Gas Company is now extending its mains from Balboa Beach, Calif., along the coast to Laguna, popular artists colony of California, and natural gas service will be in operation there early in March.

FRANK H. BIVENS TELLS ROTARIANS ABOUT GAS

On February 4 Rotarians of Whittier, Calif., listed to Frank H. Bivens, general agent of the Southern Counties Gas Co., as he presented a picture of the gas industry's development from earliest times, with special reference to gas service in Whittier.

TUCSON COOKING SCHOOL

More than a thousand housewives of Tucson, Ariz., attended sessions of the cooking school recently conducted by Grace Jo Mason for the Tucson Gas and Electric Co. Miss Mason will next go to St. Johns, New Brunswick, to conduct a school for another Federal Light and Traction Company utility.

REPORT OF WYOMING GEOLOGIST SHOWS IMPORTANCE OF GAS

Wyoming is the sixth state, in point of natural gas production, as shown by a recent report of State Geologist Bartlett.

COMMUNITY NATURAL GAS CO. BUILDS IN FREDERICK

The Community Natural Gas Company, which recently opened gas service in Frederick, has started construction in that city of a new brick building to be used for its headquarters. The front part of the building will be used for offices and the rear for a warehouse and storage room.

MERZ TO REPRESENT DETROIT VAPOR STOVE CO.

A. C. Merz has just been appointed California representative for the Detroit Vapor Stove Co., manufacturers of the White Star gas range.

MISSOURI UTILITY MEN MEET AT CAPE GIRARDEAU

May 5, 6, and 7 are the dates for the annual convention of the Missouri Association of Public Utilities. Cape Girardeau is the convention site.

CONCRETE POURED ON GENERATOR BUILDING IN PORTLAND

The Portland Gas & Coke Company's new generator building has the concrete poured up to the operating floor and the steel columns and roof construction erected. The material for the first of the four 5,500,000 cubic feet per day gas generators has been ordered from the mill. Local contractors have been awarded the contract for the fabrication and erection. The early start which was made will make it possible to have the new generator and auxiliary equipment ready for operation well ahead of any peak demand next winter.

HAYWARD MAKES COAST TRIP

Harold A. Hayward, secretary of the Connelly Iron Sponge & Governor Co., Long Island City, New York, was on the Pacific Coast during the last month, visiting the utilities companies from Vancouver to San Diego. He was accompanied by his wife.

INDUSTRIAL FUEL ADDS NEW COMPRESSORS AT BREA

Compressor capacity of the Industrial Fuel Supply Co. at Brea, Calif., has been doubled, with the addition of new compressors, several of them of 200 h. p.

O. C. FIELD GASOLINE PLANT NOW IN OPERATION

The O. C. Field Gasoline Corporation has placed in operation a type 75 semi-portable Southwestern natural gasoline plant at Huntington Beach, Calif., which will have a daily rated capacity of 7,500 gallons. The Huntington Beach gas has a natural gasoline content of 3 gallons to the thousand feet, and it is likely that the plant will be run beyond capacity, due to large amount of gas available.

STEVENS VISITS WEST

F. E. Stevens, president of the Lattimer-Stevens Co., with his wife, was on the Pacific Coast during February.

UTAH MAN AT P. C. G. A. MEET IN LOS ANGELES

L. C. Olpin, auditor of the Utah Gas & Coke Co., Salt Lake City, Utah, attended the regional meeting of the Pacific Coast Association held in Los Angeles in February.

MAY DRILL IN CITY LIMITS OF DE BEQUE FOR GAS

Townsite drilling for natural gas may be a development of this spring for De Beque, Colo., where the presence of shallow gas sands has been proved.

PICHER, OKLA. GAS OFFICE TO BE ENLARGED

C. F. Drake, district manager of the Consumers Gas Company at Picher, Okla., announced recently that enlargements are to be made in the Picher office of the company to provide facilities for increasing business in that community.

PRIVATE GASOLINE SUPPLY FOR RANCHER

Carlos Sandoval, a Mexican rancher who has lived for a number of years near Garcia, Colo., favors a personal blend of motor spirits, consisting of kerosene and natural gasoline from his own well, which also supplies his domestic gas needs.

OKLAHOMA GAS & ELECTRIC SELLS TO SOUTHWESTERN

Properties of the Oklahoma Gas & Electric Co. at Elk City and Clinton, Okla., have been purchased by the Southwestern Light & Power Corp.

They Crave Convenience.

Your consumers have become accustomed to a thousand modern conveniences. They are rebelling against going into a fog of coal dust and ashes in dark basements, to keep coal fires burning in antiquated heating plants.

Could anything be more convenient than just to press the button when you want heat?

"PAYNE HEAT" is as modern in its appeal as electric refrigeration and is being as eagerly welcomed. It has been the answer to modern home heating requirements for twelve years here on the Pacific Coast.

If you are facing this big opportunity squarely you will as a starter dictate a letter to your stenographer asking for Catalog 27-A.

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VAN STONE NIPPLES
HIGH HUB · LOW HUB · REDUCING · WELDING · BLIND

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FLANGES MFG'D TO SPECIFICATIONS

MAAS Oxide

Removes the Maximum Hydrogen Sulphide from Gas

A highly potent Commercial Compound developed after careful research and exhaustive tests in the Maas Laboratories and used extensively by Gas Companies for removing Hydrogen Sulphide from gas at low cost with high efficiency.

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SOUTH CHESTER STEEL PIPE

Excels for Gas Service

The unusual care given to accuracy of diameter and welding qualities, makes Chester Pipe a favorite for gas lines.

SOUTH CHESTER TUBE CO.
Chester, Pa.

The Public Must Know Essentials *of* Ventilation

(Continued from Page 31)

when, instead of the noxious products of combustion passing off, the reverse takes place and they are blown or forced back into the room.

Whenever vents communicate directly with the open air the serious inconvenience of sudden drafts is to be contended with, for there is always some particular direction of wind which causes annoyance. A partial remedy here, however, is to baffle or close the orifice with a pierced sheet of tin, board, or a wire cloth.

In order to replace consumed air with fresh air from the outside, openings should be made near the floor. If these are carefully distributed in a series of small orifices at the back of or in the baseboards, no draft will be perceptible.

A mistake is often made by providing an opening near the ceiling for the escape of impure air, without making any provision for a fresh supply. Under such circumstances adequate ventilation is manifestly impossible. Yet it is better than nothing, since a current, however slight, will draw at least some pure air through the cracks and crevices of doors and windows.

LEGISLATION WOULD HELP

I hope to see the time when every architect in the whole country will be compelled by law to install air flues in every building and room, large or small, where humanity works or plays or sleeps. The outlet flues should terminate under a well-ventilated roof space to protect them against the direct action of the wind, allowing the contaminated air to find its way through the space between the ceiling and the roof to the outside. Similarly, there should be established other flues or openings into the basement, or into a protected space under the house, through which fresh air may enter.

This, of course, will not apply to buildings in which a mechanical system of air renewal is required, and to this phase of the problem we need give no attention, since architects and builders provide amply on a large scale that which they ignore entirely in smaller units. Yet the ventilation of small houses is a problem not to be under-emphasized, and our every effort should be directed to the perfecting of some means of ventilation, however incomplete or unmechanical, which will relieve the conditions obtaining in literally hundreds of thousands of cases where absolutely no provision for circulation of air has been made.

In California, particularly in the southern part of the state, the venting of gas appliances and the ventilation of rooms receive a lamentable minimum of attention. This neglect is due principally to our semi-tropic climate, which causes us to deliberately close our eyes to the unhappy results of insalubrious conditions when the thermometer falls occasionally and it becomes necessary to close doors and windows. When the season of intermittent cold snaps comes the gas customer bestirs himself in preparation for the use of his frequently unvented gas heater, located just as frequently in an unventilated room. And then the yearly comedy-tragedy begins: the walls are damp, the air is contaminated, the eyes smart, the throat tickles, the head aches, and at times the drama takes even more serious turns.

Now it is only too true that the gas appliance and the gas itself cause most of the trouble; yet the user knows, without effort of thought, that the results would be infinitely worse if he allowed the products of combustion of oil, coal, or wood to escape into the room. He should, then, in all common sense, realize, without knowledge of chemistry or mechanics, that the difficulties in the use of gas are only a matter of small degree, and he should make some little, but none the less necessary, provision for them. But the fact remains that he does nothing except complain, either of the gas, or the appliance, or both. And so the matter will stand until some responsible individual or organization, familiar with the situation, and possessing the courage of conviction, grapples with the problem at its root, which, today, is not so much the unvented appliance as it is the unventilated room.

Ventilation may be accomplished—where no other method is possible or advisable—by making small perforations in the floor of room corners, or in the doors sufficiently scattered to avoid too great a current. When these perforations are in outside doors or window frames, they should slant down to prevent the rain from entering.

ONE SIMPLE METHOD

A simple, most effective means of ventilation, which can be put into operation at short notice in a house of any sort, from a shack to a mansion, is shown in the accompanying diagram. It costs next to nothing, and is usable in all kinds of weather, winter or summer, wind or rain.

Use a piece of wood about one inch thick and three inches wide, and as long as the width of the window and sash. Open the window at the bottom and place this board in the opening, on edge, and lower the window upon it so as to hold it in place. This will make a space between the upper sash and the lower sash so that air will be allowed to come into the room. If possible, this should be done with windows on opposite sides of the room, so as to establish both an inlet and outlet for the air, although windows so arranged, side by side, will provide a current of air for a room, and even one window so arranged will provide relief by either drawing or forcing the air through cracks around the door, and elsewhere.

It should, however, be definitely understood that this is, at best, a makeshift, to be employed only in rooms where no ventilation exists. It is under no circumstances recommended as a completely satisfactory means of air renewal.

The gas industry has surmounted obstacles beyond number. There remain, however, many problems of application and understanding which are still to be confronted. Not the least important of these is that of public education in the rudiments of common-sense ventilation. Any measure that will emphasize the need for fresh air in human habitations will repay the public in comfort, in saving, and in health.

GAS MOST ECONOMICAL FOR HEAT UTILIZATION

As a fuel, gas represents the most economical source of heat utilization. To supply enough current for heating and cooking ing in the homes now using electricity for electric lighting purposes, would require an estimated 750,000,000 tons of coal. To supply these homes with gas for cooking and heating would require only 82,000,000 tons of coal.

ASKS FRANCHISE IN BURNS, ORE.

Mrs. W. E. Carrico has asked the city council of Burns, Ore., for a 25-year franchise to serve natural and artificial gas.

PORTLAND SENDOUT GAINS

The Portland Gas & Coke Co. had a welcome increase in sendout in January due to a spell of cold weather. The sendout for the month was approximately 518,000,000 cubic feet, which was an increase of 1.58 per cent over January 1926.

RUSSELL TRANSFERRED FROM HOMINY TO CUSHING

W. V. Russell, superintendent at Hominy for the Oklahoma Northern Utilities Co., has been transferred to Cushing to succeed Superintendent M. L. Winand, who died recently.

LINDSAY FUEL CO. SERVING GAS IN LINDSAY, OK.

Lindsay Fuel Co., a branch of the Ohio Fuel Supply Co., is now serving natural gas in Lindsay, Ok., from the Critchlow wells, 13 miles southwest of that community.

MATHIS WANTS NATURAL GAS

The chamber of commerce of Mathis, Texas, is on the lookout for capital interested in bringing natural gas to that community, according to an editorial in the Mathis "News."

CHARTS FOR COMPUTING LEAKAGE

TWO nomographic charts, for use in quick computation of the leakage losses from natural gas lines have been prepared by E. O. Bennett, natural gas engineer, Bureau of Mines, Department of Commerce.

Various methods of making leakage tests have been tried during a study of losses in the transmission of natural gas conducted by the Bureau of Mines in cooperation with the Natural Gas Association of America. Results of tests show that the "shut-in pressure-drop" method is the most accurate and reliable; therefore its use is recommended. In Serial 2751, just issued by the Bureau of Mines, there is described a graphic method for computing the rate of leakage from the fall in pressure and change in temperature determined by the "shut-in pressure-drop" method of testing.

DEAD WEIGHT GAGE USED

The gas is "shut in" the line to be tested and is not allowed to escape except through existing leaks. The leakage causes the pressure in the line to fall. The change in pressure is obtained with a dead weight gage. Approximate results may also be obtained from readings on a good spring test gage. Numerous tests show that the dead weight gage is more sensitive to small changes in pressure than spring gages.

The temperature of the gas in the line is observed simultaneously with each pressure reading. Temperature changes affect the pressure exerted by a given quantity of gas "shut in" a line, and since the rate of leakage from a closed system is directly proportional to the rate of pressure drop, fluctuations in temperature must be considered.

QUICK COMPUTATION POSSIBLE

The two nomographic charts, prepared by Mr. Bennett, are arranged to give the leakage rate of gas from lines of various sizes. The charts are intended for ready reference in making field tests, and give a convenient method for quick computation of the leakage losses from lines. The yearly rate of leakage per mile of line, and the equivalent yearly leakage per mile of 3-inch line, can be determined from the charts. The leakage is expressed in thousands of cubic feet of gas, at a temperature of 60° F. and a pressure of 30 inches of mercury at 60° F.

Copies of Serial 2751, and of the two nomographic charts, may be obtained from the Bureau of Mines, Department of Commerce, Washington, D. C.

THIS PIPE WILL BE BURIED AND FORGOTTEN FOR MANY YEARS —Because it is coated with BITURINE ENAMEL. It will give good service—because BITURINE ENAMEL defies rust and corrosion.
(Biturine Enamel applied over 20 years ago is still in perfect condition and shows no sign of deterioration.)
BITURINE ENAMEL forms a tough, impenetrable coating one-sixteenth to one-eighth inch in thickness which is unaffected by acids, moisture, alkalis or electrolysis.
BITURINE ENAMEL is giving every-day, all-weather protection to pipe lines, tanks, reservoirs, penstocks, bridges, tank steamers and other severely exposed structures.
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The Wood Automatic Storage Gas Water Heater

The Standard Combination Storage Gas Water Heater

Electric Weld Range Boilers and Storage Tanks

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The One Sure Way To Stop Joint Leaks

Makes joints 100% tight — absolutely leakproof where all other methods fail.

Throughout the gas industry this non-corrosive, greaseless compound is being used to end all trouble from leaky joints.

Due to its scientific preparation and graphite base, this paste is **oil, acid and gasoline proof.** It is soluble only in water. Of paste-like consistency, it is **easily spread** on pipe joints, fittings, flanges, flange unions, and every place where a leakproof joint is desired. **It expands under heat, filling every crack and crevice—then carbonizes.**

It renders joints not only leakproof, but easy to take apart if desired.

Key Graphite Paste will guarantee you a genuine service in every Department, from the Garage to the Power Plant.

Put up in any size container, from a one-pound can to a five hundred pound drum.

E. A. Key Company, Inc.
1431 Santa Fe Avenue
Los Angeles

KEY Graphite Paste

PIPE

Montague-Wade Safety Water-Tube Boiler

Guaranteed more pounds pressure, horse-power for horse-power. Gets up full head of staem quicker—won't blow up—can be cleaned quickly—easily.
1 to 20 h. p. and larger.
Full details and prices upon application.

Montague pipe and other steel products have stood the test of time. You'll find it a good investment to use them.

Riveted Steel Pipe
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What Is Greatest Present Need *of the* Gas Industry?

Each month WESTERN GAS is publishing one of the three-minute speeches made on the above subject at the Pacific Coast Gas Association Convention of 1926. The following speech was delivered:

By ISABEL ALLOBACH
Southern Counties Gas Co.

IT IS hardly necessary to mention that the success of every business is dependent upon two vital factors: Friendship of the community, and increased sale of products. The gas industry is no exception.

Fifteen years ago bankers were hiding behind mahogany partitions; public utilities' stock sold only in five and ten thousand dollar blocks.

Today Mr. Banker is out in the open; the smallest depositor may gaze upon his haughty countenance . . . only it isn't haughty any more . . . it's beaming. He's making friends.

Stock in public utilities sells for $10 down and five a month. . . . "A dollar down and a Sheriff a week," said a movie star when her creditors closed in.

HOME SERVICE IS PUBLIC RELATIONS

"Public Relations" is a new phrase. It's friendship with a boyish bob. Home Service is simply an alias.

Home service has as many wave-lengths as the radio. It reaches into the home and makes a friend of the housewife; incidentally the husband.

It goes into the clubs and church organizations and gives them not only active assistance, but furnishes materials for their work. It extends the same courteous service to its competitors' customers; it works with the Parent-Teacher Associations, and it also goes into the school rooms. Always and forever it is preaching the doctrine of proper and economical use of gas and preparation of food. It makes friends as it goes.

Commercial departments find Home Service their best first aid, not alone as a creator of sales, but in making a booster out of the purchaser.

A PROFITABLE DEPARTMENT

The Home Service department instructs the experienced housewife in the proper use of her new range; and the one whose wedding ring still shines is also taught the correct and economic preparation of food; both are encouraged to do more cooking . . . which uses more gas.

The Home Service department creates faith and confidence in the community through its intimate contact with individuals, and its ever ready help for their personal needs.

It brings the women into the company's offices with some other object than to pay a bill or register a complaint; they come to cooking classes; they want new recipes, suggestions for a luncheon or dinner; they are made to feel that we belong to them, and they to us . . . and friends are made.

The Home Service department increases gas sales; it increases appliance sales; it establishes consumer contact; competitive dealer contact; it tunes in with every department of its own organization.

WINS PUBLICITY

It wins the heart of its local paper, and its activities furnish news stories . . . the most effective advertising.

You must admit that the Home Service department is the greatest need of the gas

industry today, for its work is all done to the refrain of:

Make friends; make friends; make friends.

Friendships reduce the cost of operation by eliminating complaints; they increase the consumption of gas, as the women have been encouraged to cook through instruction in the simple and economical preparation of food; more hot water is used through these kitchen activities. After a delicious meal the radiant fire or furnace is lighted and the family spends the evening at home instead of at a movie. There is no limit to the possibilities of the Home Service department's activities.

Manufactured Gas Supplies Modesto's Fuel Needs

(Continued from Page 25)

four degrees during the time work was going on, and this was no doubt due to both a heavy run of cold fruit and the addition of cold water. A plan for utilizing waste heat to heat water would no doubt increase the efficiency of the plant materially. There was no shut-down during the working period caused by the gas appliances, therefore giving gas a perfect reliability record. In spite of the fact that cold water was added at times in large quantities, work continued just the same, and as stated before, the temperature of the water held up to boiling with the one exception.

NEW YORK CITY ORDINACE ON GAS TUBING

New York City has made an addition to its sanitary code which makes it a misdemeanor punishable by a fine of $500 or imprisonment for one year, or both, to sell flexible gas tubing which does not conform to certain tests and specifications, practically those adopted by the American Gas Association. The standards for flexible gas tubing prescribed by the Pacific Coast Gas Association are similar to those of the A. G. A. It is interesting to note also that the cities of Newark and Baltimore have taken the same action as has New York.

MORE ADDITIONS TO VALLEJO PLANT OF P. G. & E.

Further extensions to the Vallejo plant of the P. G. & E. have included the installation of two 150 H. P. Sterling boilers, from C. C. Moore and Co., Engineers. A No. 7 Wilbraham Green Exhauster (rotary type) is also being installed at this same plant.

KEY CO. MOVES L. A. OFFICES

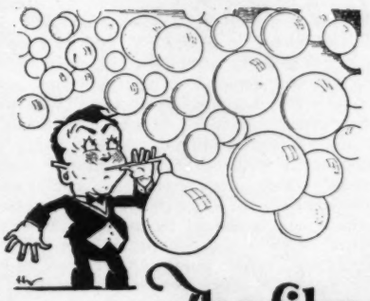
The E. A. Key Company has moved its Los Angeles office from 1301 Santa Fe Avenue to 1431 Santa Fe Avenue.

ADD 17,000 SHAREHOLDERS TO STANDARD G. & E. SYSTEM

In 1926 there were 17,000 new shareholders added to the list of customer owners of the Standard Gas and Electric Company, raising the total to approximately 100,000 at the end of the year.

BARBER-GREENE COMPANY HAS BOOKLET ON DITCHING

"Ditching Snapshots and Records" is the name of an attractive, well-illustrated booklet recently issued by the Barber-Greene Company, Aurora, Ill., manufacturers of the Barber-Greene Ditcher.



The film on the bubble draws the gasoline out of the gas!

The Film on the Bubble Draws the Gasoline Out of the Gas!

Extraction of gasoline from natural gas is most efficiently accomplished by the absorption method whereby billions of bubbles serve as the medium for drawing the gasoline from the gas.

It therefore stands to reason that the greater the amount of bubble film area the higher will be the absorptive power of the lean oil which is the vehicle that carries the gasoline to the stills.

In Campbell Oil-Froth Absorbers the action of the wet gas and the lean oil forms a fine froth which permits intimate contact between gas and oil, thus effecting thorough absorption.

Campbell Absorbers have increased gasoline production in every plant where installed.

J. A. Campbell

Consulting—Designing—Constructing

P. O. Box 669 Natural Gas Engineer Long Beach, Calif.

CAMPBELL OIL FROTH absorber

J. B. GILL CORPORATION

NATURAL GAS ENGINEERS

COMPRESSOR PLANT DESIGN AND CONSTRUCTION

P. O. BOX 669

LONG BEACH - - - CALIFORNIA

You Can Bury Your Pipe and Forget Re-Conditioning for Years, When Protected With—

ECLIPSE

SAVE-A-LINE

You can save thousands and thousands of dollars in repairs and replacements by protecting your pipe lines with this tough, elastic, non-cracking, non-peeling, heavy filmed coating.

ECLIPSE "Save-A-Line" has for years stood the only test that tells a true story—actual use in the fields. We can cite you instances where "Save-A-Line" has been used on pipe **laid in swamps** and on being examined years later was found to be **untouched with corrosion!**

The following well known companies subject all pipe line coatings under consideration, to a severe, but fair test. As a result they selected ECLIPSE "Save-A-Line" and are now using it regularly. The total of their orders last year ran into hundreds of caraloads.

ECLIPSE "Save-a-Line" is applied direct from package—no heating, sizing, wrapping of paper or burlap required.

Gulf Pipe Line Co.
Lone Star Gas Co.
Humble Pipe Line Co.
California Petroleum Co.
The Shell Co. of California.
Wilmington Gas Co.
Coast Counties Gas & Elec. Co.
Public Service Gas & Elec. Co.
New York State Gas & Elec. Co.

The Eclipse Paint & Mfg Co.
Cleveland, Ohio, U.S.A.

Dallas Denver Newark
Philadelphia Charlotte, N. C.
San Francisco

Surface Protection *of* Underground Pipelines

(Continued from Page 23)

area, a very good protection is obtained. This is because the high intensity current at breakdown points in insulation will do no harm where it comes on, and can do little harm where it leaves, the pipes in the positive zone, because it will be low both in quantity and in intensity. This protection may be limited by the extraneous condition of the insulated network being interconnected with other underground pipe systems which are bare. If insulation can be applied to but one of two intersecting pipe lines, it should be used on the negative pipe to protect the positive pipe from electrolysis. When surface coverings are used in positive zones for soil protection, care should be taken that the potential stresses are kept down to reasonable values.

A PRACTICAL TEST

In Fig. 2 are shown sections taken from pipe specimens that were subjected to the same positive electrolytic stress of 15 volts, to earth, for about the same length of time, one, 11A, being bare and the other three having surface insulations of selected qualities. These specimens were made air tight of 2-inch wrought iron pipe in 10-foot lengths, with provisions for introducing and gauging air pressure. They were weighed at start and finish, to ascertain their losses. Tests were made frequently to determine the current leakage to soil and the date of their failure to hold air pressure.

Test Data Showing Efficiencies of Surface Insulations in Protecting Pipes from Loss of Weight and Life

Specimen Number	*Kind of Insulation*	*Leakage in Amperes Start*	*End*	*Average*	*Loss of Weight*	*Time to Pipe Failure*
11A	Bare pipe—none	.160	.155	.157	80 oz.	354 days
4A	Paint—good	.027	.072	.050	15 oz.	No failure
2B	One layer Pabco covering—better	.000	.036	.018	8 oz.	201 days
12A	Two layers Pabco covering—best	.000	.007	.003	0 oz.	No failure

The conditions of the test were those of a severe positive electrolysis location. While the bare pipe, 11A, suffered extreme electrolysis, as shown in above table, in terms of current leakage and loss of weight, it did not break down as soon as specimen 2B, with a high grade insulation. The ratio of the electrolysis of these two specimens—one bare and the other well insulated—was 10 to 1 in loss of weight and 2.0 to 3.5 in loss of life.

The photo of 12A shows by the pitting that the insulation had broken down here and there, although it was installed and started in test one month later than the others. A poor idea of the worth of these insulations in protecting pipes from electrolysis when used in positive zone, may be had from comparison of the current and weight losses. It would give, however, a good idea of their relative efficiencies for protecting pipes against electrolytic depreciation when used in negative areas. Their relative efficiencies when used in positive zones in prolonging pipe life is given in the column of time to failure, which indicates that much benefit should not be expected of pipe treatments when used contrary to scientific principles. Pipe insulation in a positive zone is a chain whose strength is measured by its weakest link, which is a flaw or an abrasion.

SOIL CORROSION

The practice of insulating a pipe to prevent soil corrosion, which is a greater enemy than electrolytic corrosion, because it is more prevalent, has never been questioned. It is for this reason that pipe coverings should be made and purchased primarily with the idea of securing protection against soil corrosion, and to regard any degree of electrolytic protection they afford as net gain. It will be fortunate indeed, if it is ultimately found that the same intrinsic qualities must be built in the pipe coverings to secure protection against both electrolytic and soil corrosions. When these qualities have been determined it will not be difficult to make comparative tests of different coverings, which should lead to their perfection by the manufacturer and proper selection by the purchaser.

The writer believes that this basic quality necessary to make a covering good from an electrolysis standpoint is a high initial and long sustained insulating strength, and that its efficiency can be experimentally determined by a measurement of this insulation, or by current leakage, which amounts to the same thing.

Regardless of questions of the exact cause and nature of soil corrosion it is generally agreed that the corrosive elements of the soil are oxygen, salts and moisture, the former two of which are carried in solution by the latter. This being true, surface coverings will protect pipes from soil corrosion just to the extent to which they prevent contact of the pipe to the earth or its moisture. When this contact begins to be established in any way we may expect it to be indicated by a reduction of the pipe insulating strength. It would appear that a pipe covering that has a high initial and sustained insulating strength would protect pipes against both electrolytic and soil corrosion and, furthermore, that its probable value might be determined by measurements of this resistance.

The following test for determining the comparative values of pipe covering is based on our assumption that there should be minimum contact between earth moisture and pipe, and that the rate of contact being made can be measured by loss of resistance of the pipe covering. In Fig 3, O is a short bare pipe placed vertically in soil of known high corrosiveness, equi-distant from other similar pipe specimens that have been treated with various coverings to be tested. If the two specimens (AA) are bare, the average resistance of a given covering on any other pair, such as (BB), can be measured by subtracting the average resistance between O and AA, which is the resistance of the soil, from the average resistance between (O) and (BB), which is the total resistance of the soil and the insulation on (BB).

In a test now under way, the Pabco Pipe Covering showed a much higher initial and sustained resistance for the four months during which insulation tests were made. One pipe specimen from each pair will be removed for examination of corrosion at the end of the first and second years. If these examinations disclose that less corrosion oc-

(Continued on Page 54)

Meet Miss Home Service!

(Continued from Page 24)

wives, business girls, boy and girl scouts, even business men; purely educational—commercialized in no sense of the word—and because she produces luscious lemon pie and golden ponge cakes of marvelous texture with an ease and a joy seldom seen in the kitchen, she sells for you more gas appliances than can be accomplished in days of door-to-door canvassing. She gives recipes in time and temperature, thereby showing the need for ranges with oven-controls. She demonstrates that hot water for laundry and sanitation is a necessity for home comfort and happiness, that evenly heated rooms are most essential for Baby John's health. Ah — a new recipe — for "Congo Pie"—and Mrs. Housewife dashes happily home to try out the new dessert!

Two of the three major objectives of Home Service are accomplished right there, these being:

1. To sell more gas.
2. To sell gas appliances.

But perhaps your company is not particularly desirous of increasing its load—perhaps you have not gone in for merchandising. In that event, Home Service plays her leading role—that of building up good will.

HOME SERVICE BUILDS GOOD WILL

A gas company has no class of customers, no selected clientele. It has one customer—the community. The friendship and good will of that customer is its biggest asset.

When you find a woman calling up the gas company (which she has been known to class as "a bunch of pirates") for help in deciding what set of dishes she should buy, or writing in for menus planned to aid in removing excess anatomical upholstery—you have gained a contact which is of inestimable benefit to the company. The woman who despairs of ever making a decent cake and is shown how to through Home Service, is a friend for life.

Women need and appreciate a reliable source of home-making information, and where would it be more logical for her to obtain help in planning her kitchen than from the gas company which supplies the 100 per cent fuel for her most used kitchen appliance, the range? Yet, in most cases, she is having to resort to magazines and shopping guides for advice applying indirectly to the commodity which is the life-blood of our jobs—from president to meter-reader.

There are in addition to these three major objectives—selling gas and gas appliances. and building up customer relationships—several minor accomplishments, which should go to the credit of Home Service, among them, increased publicity and educational features.

Illustrated recipe cards sent with the gas bill, columns of timely hints and housekeeping hunches in the newspapers, cook books, lecture-demonstrations before clubs, schools and other groups, and the wonderful opportunity in radioland of broadcasting to an unseen audience of housewives—here is a contact no masculine mind could make, a better form of advertising than that for which many a bottle of printer's ink is wasted.

AN INDEPENDENT DEPARTMENT

A Home Service Department should operate independently, since it is a unit in itself, functioning both in improving public relations and in increasing sales and domestic appliance load. "Since Home Service extends its influence into practically every department of the gas company from selling to servicing, it necessarily follows that the control and supervision of this activity should

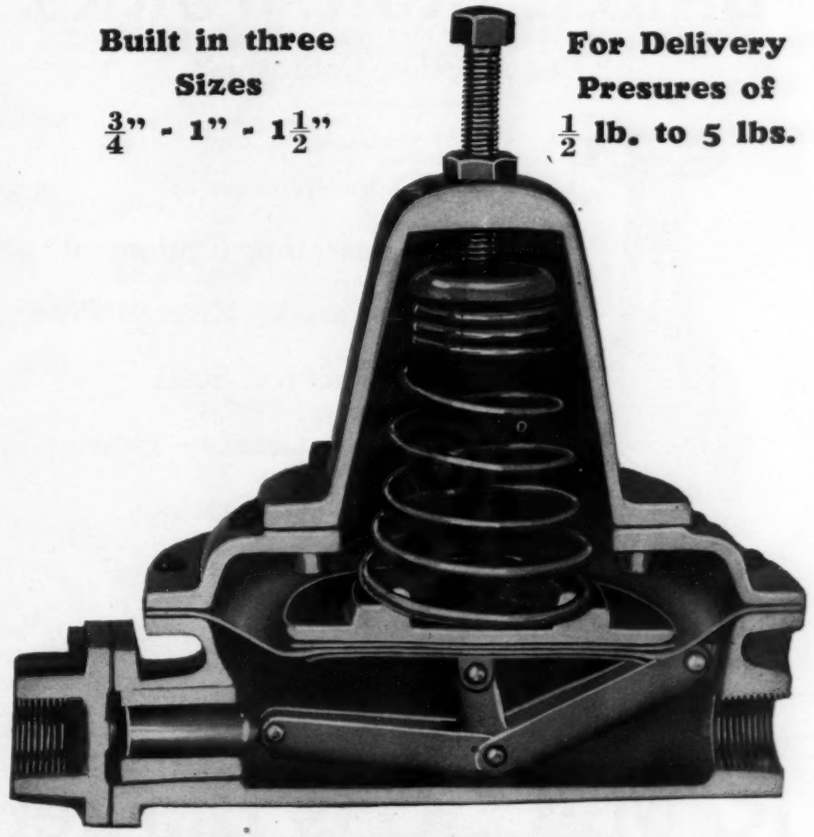
The Reliance High Pressure Regulator

Built in three Sizes

$\frac{3}{4}$" - 1" - 1$\frac{1}{2}$"

For Delivery Presures of

$\frac{1}{2}$ lb. to 5 lbs.



Particularly suitable for Industrial Plants where positive lockup, close regulation and large capacities are desired. Prices upon application

Reliance Manufacturing Co.

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Eastern Representative	Northwestern Representative	Mid-Continent Representative
Isbell Porter Co.	Northwest Gas & Electric Equipment Co.	Westcott & Greis
Newark, N. J.	Portland, Oregon	Tulsa, Okla., Dallas, Texas

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DESIGNERS, FABRICATORS & ERECTORS OF PRODUCTS OF **STEEL**

Investigate WESTERN Hi-Pressure Unit Gas Holders

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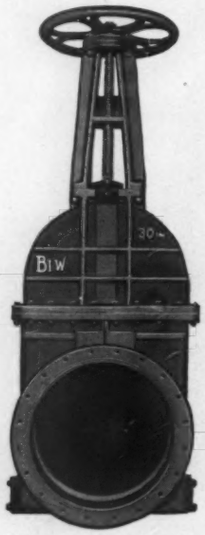
BAKER IRON WORKS

Los Angeles, California



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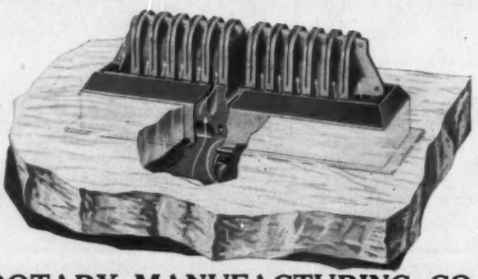
Secondary Air Properly Introduced



Insures High Furnace Temperatures

ROTARY MANUFACTURING CO.

5720 Long Beach Avenue **Los Angeles, California**

The Beacon Automatic Storage Water Heater

Has a Brass Heating Element With Six Times the Heat Conductivity of Iron

The Beacon is a heavy duty appliance—high grade materials throughout. The boiler is made of heavy gauge galvanized iron and all seams are both riveted and welded.

In addition to the heart of BRASS the Beacon has a rust-proof BRASS circulating pipe which keeps the water clean.

Beacon Water Heater Co.

Geo. F. Pearse

776 So. San Pedro St. **Los Angeles, California**

be placed as high up in the organization as possible, in order that it may contact with and function to assist asmany collateral departments as are affected, and also, so that it may fit into the basic policies controlled by the major executives of the company."* The more "bosses" there are, the more handicapped will be the Director's initiative and scope.

The personnel of such an organization depends upon the growth, as well as upon the size of the company. There should be a director and assistants both in the field and for clerical work. There are five essential qualifications for a successful Home Service Director:

First: Home Economics training.
Second: Personality.
Third: Energy.
Fourth: Personal neatness.
Fifth: (And above all else) Vision!

Within the department all records of Home Service activities should be kept. It should operate upon a budget, handling all things strictly pertinent to Home Service activities, and leaning upon no one department for support.

Well-planned Home Service benefits so many departments of activity that the allocation of the costs of this department can best be decided by the individual gas company, according to the scope of the Home Service rendered.

Similarly, the cost of operation is based upon the activity permitted Home Service. There is no tangible measure of results—just as in advertising and window displays. Good will can not be measured in terms of dollars and cents. Checking the load curves on special days, such as Thanksgiving and Christmas, or after radio announcements, installation of temperature-controlled ranges and the like give some measure of its value in load building. The effect of Home Service on appliance sales is harder to trace except in individual cases.

The fact that over ninety gas companes have adopted Home Service is some evidence of the justification of its existence. According to a report just issued by the American Gas Association, seven and one-half million women received instruction in the art of cooking from the Home Service Departments of gas companies during the year ending November 1st. This was done through cooking schools, telephone interviews, home calls and cooking lectures over the radio. Now—does Home Service pay?

Home Service fails only when it isn't given a chance, when your executives are not back of it, when you expect it to give something for nothing. If you can break away from the Altar of Custom with its offerings of man-made plans for cooking demonstrations, advertisements based on endurance, and strength of an oven door, and give your selling and service a cold cream slant—you can not help being sold on Home Service.

The gas industry needs Home Service—and woman! She can help you more than you realize.. There is but one view! Do you remember the story of the little boy looking at a circus poster of an elephant spinning around on the tip of its tail on an inverted water bucket!

A doubting companion asks the child: "Do you believe an elephant can do that?" "Sure," the little believer answers, "I don't think there ain't nothin' that an elephant can't do!"

*From "The Bulletin" of Standard Gas Equipment Corporation.

**From Report by American Gas Association.

Selling Gas Appliances *in* Electricity's Stronghold

(Continued from Page 29)

mighty hard to sell them in Great Falls.

We find that servicing of appliances is a very important factor in successful merchandising. We have one service man who devotes his entire time to the servicing of appliances on the customers' premises. The larger users of gas are visited by the service man periodically, at least once every two weeks and oftener if necessary. The domestic customer is visited by the service man on calls by the customer. Each salesman also has a small tool kit consisting of a pair of pliers and a screw driver. He makes minor adjustments and repairs in the home while making his calls. This leads to a basis of closer contact with the customer than can be ordinarily obtained. If there is anything wrong that he cannot adjust, the service man is sent out to take care of the complaint. All service complaints as well as high bill complaints are taken care of promptly and adjusted satisfactorily as soon as possible. All service orders are looked over by the manager after being completed. If there is anything which the service man could not adjust satisfactorily with the customer, it is turned over to the salesman who settles the complaint and oftentimes sells new equipment where the equipment is old and cannot be made to work efficiently.

Servicing of apartment house ranges comes under a little different routine than the other classes. At periodic intervals of three months, a letter is sent to all apartment houses in the city. With this letter a blank form is enclosed on which the apartment house owner may list the apartments which need attention. A stamped, addressed envelope is enclosed in which to return this form. Immediately upon receipt of this from the apartment house, the ranges are serviced. We find that this makes it much easier for the owner to keep his tenants satisfied and establishes a closer contact between the owner and the company. This makes it mighty hard for anyone to talk electric ranges to these apartment house proprietors.

High bill complaints are taken care of separately in order that they may be completed promptly. A special form is used to enter high bill complaints and all the data pertaining to the account are entered on this form. It is the policy of the company to settle these complaints as soon as possible in order that the customer will not talk to the neighbors about his high bill. If there is any doubt about the settlement, the customer is always given the benefit of the doubt. This has been a very satisfactory method of handling these high bill complaints, and makes the customer feel that we are giving him a square deal. He goes away satisfied and is a good booster for gas, which is some of the best advertising that a company can get.

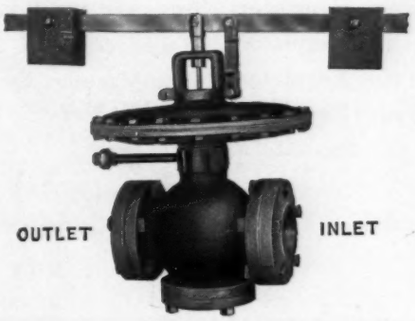
CONNECTING NEW APPLIANCES

The routine of connecting new appliances has been worked out so that a new range goes into a home in perfect condition. When a new range is sold by the salesman, the order is turned over to the sales manager. A sales order, order to change meter and governor, and an inspect order are made out and handed to the foreman in charge of installations. The range to be installed is cleaned and shined up so that it looks as nice as a new grand piano. Before leaving the warehouse, the range is inspected by the foreman. The range is then delivered to the customer's premises and is set on wooden trusses so that it will not mar the

For District or Individual Service—
The Weighed Illuminated Regulator

A medium pressure of 15 pounds or less is reduced to a delivery pressure of a few inches of water.

This is but one of the valves described in our catalog. Sent on request.



The Chaplin-Fulton Mfg. Co.

Organized 1884—Oldest Builders of Gas Regulators in the Country. Built in all sizes, From 1 Inch to 24 Inches; For All Service. 1 oz. up to 1,600 Lbs. Pressure to Square Inch.

28-34 Penn Avenue Pittsburgh, Pa.

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Heavy Duty Refractories
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Complete Stock of 9-inch Standard Bricks, Tile and Cements Carried

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The Babcock & Wilcox water tube boilers
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Hamilton compressors
Green fuel economizers
Wheeler Condenser & Engineering Co. condensing machinery
Cochrane feed water heaters (open and closed)
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THERE IS A
PABCO PRODUCT
TO PROTECT
EVERY SURFACE

The Paraffine Companies, Inc.

San Francisco Oakland Los Angeles Seattle Portland

floor or linoleum. A tarpaulin is used by all workers to spread over the floor and keep their tools and fittings on, so as to avoid getting the customer's kitchen dirty. When the job is completed, it is given the final inspection by the foreman of installation. This leaves the new range or other appliance in A-1 condition, which is as it should be. When the demonstrator goes to make a demonstration she knows that the range is properly connected and in perfect adjustment. This makes the customer feel that he is getting full value for his money, instead of a greasy range that demands a day's cleaning before it is presentable. When a customer pays a good price for a new range, he is entitled to have it installed and left in perfect condition.

The Home Service work we regard as very important, and we have found that it certainly pays to have a demonstrator to help the customers with their cooking problems. Our demonstrations are held regularly at the store three times each month. We have a demonstration on each discount day. We have found this a very good medium of advertising. It interests the customers as they come in to pay their bills. We find that there is very little difficulty in closing the sale if we can get the prospect to come in to the store and see the appliance. One of the greatest problems has been to get him in to see our range. The demonstrations have assisted very materially in working out this problem. Lots of our customers have already seen the range in operation when coming in to pay their bills. This, of course, makes it much easier for the salesmen to get an interview with the prospect.

When a new range is installed, the demonstrator goes out and helps the housewife with her cooking problems and with the operation of her new range. The demonstrator goes out to assist in the cooking problems whenever needed. A phone call is all that is necessary. This adds considerable to the company's prestige and makes a much closer contact with the customer.

We have just closed the most successful year in merchandising gas appliances in the history of the company. By our efforts along the lines indicated we have doubled our merchandise sales over previous years, increased the gain in customers 500 per cent, new connections 100 per cent and installation of appliances about 100 per cent.

This has taken hard work on the part of everyone in the organization and has called for complete co-operation between all departments. We believe that our success can be laid to hard work, rendering good service, constant advertising, and complete company co-operation with the sales department.

Surface Protection

(Continued from Page 50)

curs on pipes that have the surface coverings of the highest insulations, it would seem to indicate that high insulation is the necessary quality that must be built in pipe coverings. It might also point the way for making quick comparative tests for the relative efficiencies of pipe covering in the matter of soil corrosion. There certainly should be a means devised for quickly proving their worth in the same way that there is for testing other materials of construction.

Surface protection is the keystone in the arch of self preservation of the works of Nature and man. Protection of metallic structures against electrolytic and soil corrosion, which cause one of the world's greatest losses, can be secured best by surface treatments. Underground pipe systems have not received the attention in this respect that their value warrants. Coverings of high quality insure against electrolysis if

judiciously used, though they do not afford maximum insurance at minimum cost, due to theoretical limitations. They do give the best and cheapest protection against soil corrosion, which is a greater enemy than electrolysis. An intensive study should be undertaken by the manufacturers and users of pipe coverings to determine the intrinsic qualities that must be built in pipe coverings to obtain the highest efficiencies, and to devise means to quickly measure these qualities.

Biggest Conference

(Continued from Page 28)

President W. S. Yard presided, and each section presented one feature of general interest. H. L. Masser, for the Technical Section, discussed "The Service of Natural Gas in Los Angeles"; T. H. Ross, an industrial engineer of Los Angeles, presented the Accounting Section's contribution, which was a talk on "The Use of Statistics in Business." A playlet entitled "Service Is as Service Does" was staged by the Public Relations Section. Vernon Havenner (author of the piece) and Miss Gladys Burke played the part of a young married couple who had just moved to Los Angeles and were anxiously awaiting the connecting of gas service. A. J. Gibbons was the exemplary gas service man who personified prompt, courteous attention to the customer's every need. (N. B.—Oscar L. Moore was the Voice in the Radio). All are employees of the Los Angeles Gas and Electric Corporation, and the playlet was developed in a contest within that company. At the annual convention at Santa Cruz there will be an inter-company contest in playlets, put on by the Public Relations Section.

A gas-fired refrigerator was on exhibition at the general sessions, arranged by the Commercial Section, and D. J. Young of the Electrolux-Servel Corporation was on the program to discuss the topic, "Refrigeration by Heat." However, the delegation from the Northwest was stormbound, and Mr. Young found it necessary to telegraph his remarks to A. L. Spring, distributor for the Servel gas-fired refrigerator in Southern California and Arizona, who read it at the general session. Mr. Spring and Wm. T. Wyatt of the same company described the cycle of operation of the machine and added some remarks on merchandising possibilities. The combined discussion of refrigeration by gas will be found elsewhere in this issue of *Western Gas.*

Wednesday evening was held a banquet at the chamber of commerce building, attended by 388 P. C. G. A. members and ladies.

W. S. Yard, president of the P. C. G. A., acted as toastmaster. A. B. Macbeth, president of the American Gas Association, and Wm. Baurhyte, "Dean of Pacific Coast gas men," both gave short talks, as optimistic as they were brief; and there was a variety of excellent entertainment, including the numbers by the orchestra of the Southern California Gas Company.

On Thursday the sections held their programs. Due to the fact that the Portland delegation could not be present, W. M. Henderson, in the place of R. M. McCalley, presided over the Technical conclave, which lasted through the morning and reconvened in the afternoon to hold through to 5 p. m. One feature of the session was a first aid exhibition by teams of the Southern California Gas Company, Midway Gas Company, and Los Angeles Gas and Electric Corporation. An afternoon meeting of the Accounting group was also held.

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Refrigeration *by* Gas

(Continued from Page 21)

the garage for service, on the average, once every day. Every two months of such operation would require a complete overhauling and at the end of a year the automobile would be ready for the junk man. This is a condition after almost a generation of development. A high grade washing machine requires one service call per year, according to the records of a company selling large numbers. This represents probably one hundred and fifty hours of operation, or say one week of continuous operation. A vacuum cleaner has about the same record. Electric irons possibly a little better. The modern home, with its mechanical luxuries, has gotten to the point where a housewife must be a licensed engineer to keep it going. I, for one, am getting a little bit bored by having the maid, just as I am ready to leave home for the office, saying: "Mr. Young, the vacuum won't work,' or "The laundress is here and the washing machine is broken," or "The iron doesn't heat, or "Can you fix the doorbell?" or any of the other remarks of a like kind. When any new household machinery is considered, my first thought now is how much service it will demand. The best argument in favor of gas heating over automatic oil burners is the one just indicated. An electric washing machine bought from a department store is after all an electric device, and every case of trouble unconsciously reacts against the utility serving electricity. This cannot be helped; hence the first consideration of a gas company on refrigeration is one of service, and I caution you to give that matter serious thought.

There are two other important phases to be considered in this matter, commercial and general; but as these are interrelated, they may be considered together. First, I believe comes the point of institutional advertising or good will. It is very interesting to note the effect of refrigeration by gas on the standing of a company in the community. The mere showing of a gas refrigerator in operation on the floor of one gas company resulted in the sale of three complete house heating jobs to people whose only contact with the company was a curiousity to see this ice by fire.

Again, the effect of the advent of a gas refrigerator on the morale of a gas sales organization in one highly competitive field was very marked and the effect on sales could be noted.

THE COMMERCIAL ANGLE

For the last two years there have been talks at conventions, conferences, articles in journals—much written, much said on how greatly the gas industry needed a gas refrigerator and how it would be received with open arms. The refrigerators are now here and really the main point involved is how to successfully and intelligently promote the use of them. While in domestic use the annual consumption is not high, being from 12,000 to 20,000 cubic feet per year, still when all factors are considered, it is the most attractive business a gas company ever heard of. The load factor, diversity factor, lack of service and rate that may be charged, all show its desirability.

Getting right down to cases, the question is "What are we going to do about it?" and I can assure you that I am speaking from the viewpoint of twenty-five years experience in an operating gas company. The gas company has no sure thing in this field. Any absorption refrigerator will work just as well with electricity as with gas. Our

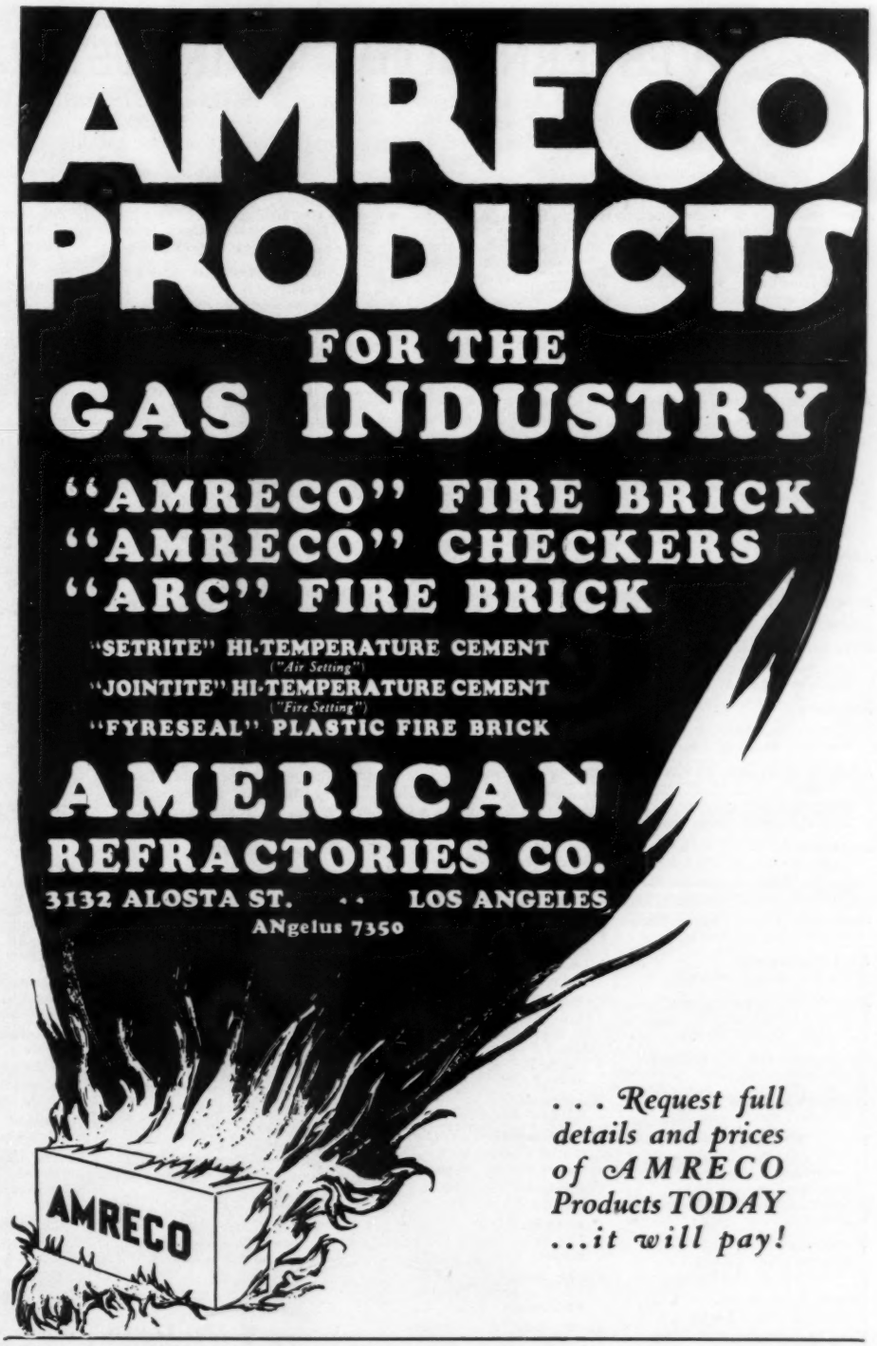
electric friends are no amateurs in the use of load factor, power factor, diversity factor in determining what rates may be charged, and on occasion they have been known to get down to first principles and apply the well known formula of "What the traffic will stand." They have no compunctions against flat rates. In other words, they are much alive and on the job and if, as many believe, absorption refrigeration is the ultimate in the domestic field, they are not going to idly sit by and let the gas company run away with it.

Whether this business, which by all the laws of thermodynamics and economics, should belong to the gas company, is obtained or not depends entirely on the attitude of the gas industry and largely on the gas company itself. On the question of gas refrigerator merchandising, there are many points that may make it a special case justifying special policies. First, there are only two or three gas refrigerators that are, to my knowledge, in commercial production, and to my knowledge only one that may be considered as in quantity production. All of these, largely due to production difficulties, are limited in their field and may scarcely be considered at the present time as competitive. At present there are not on the Pacific Coast any number of dealers selling or considering the selling of gas refrigerators other than as direct factory representatives. Therefore, any arrangements made for getting this business for gas companies would not interfere with or embarrass present going concerns.

Taking a leaf from the book of our electric friends, almost all new uses of the product have been at least pioneered by the utility. Would it be out of order to suggest to the gas companies of the Pacific Coast that the situation justifies them at least in directing the policy covering sale of gas refrigerators. I suggest that in view of the fact that the gas company through the continuing use of gas is, after all, the major one to profit, and hence should endeavor to produce the widest distribution. The gas company is the only one involved that can justify the expenditure of money for introductory purposes. Where companies at present operate a merchandising department, the sale of refrigerators becomes a logical part of it. Where companies have stayed out of this field, it seems to me that this situation justifies their assuming the responsibility, at least during the introductory period, and until that time when competition between manufacturers justifies the turning the business over to competitive dealers. Such a policy of the gas company really acting as a district distributor, with all reliable dealers privileged to sell, would undoubtedly result in the widest distribution of this wonderful gas consuming equipment.

A. L. Spring, district manager for the Electrolux-Servel Corp., discussed several additional aspects of the new refrigeration, after reading Mr. Young's paper. He gives "Western Gas" the following summary of his remarks, and those of W. T. Wyatt, Servel division engineer, who described the cycle of operation of the Electrolux-Servel machine.

THE PRODUCTION of a practical and salable Gas-Fired absorption type refrigerator marks the accomplishment of a development long sought by the gas industry. The refrigerator has been in process of continuous development for a number of years. The Electrolux absorption machine was patented a few years ago



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Readers interested in any articles not listed in these pages are cordially invited to advise *Western Gas* of their wants and every effort will be made to furnish a list of the proper manufacturers. Addresses of companies listed on these pages may be found by consulting their advertisements in this issue.

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Pacific Meter Works.

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Pittsburgh Meter Co.

Casinghead, Gas Meters
Jensen Instrument Co.
Pacific Meter Works.
Pittsburgh Meter Co.
The Foxboro Co., Inc.

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Montague Pipe & Steel Co.
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United States Cast Iron Pipe and Foundry Co.

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Westcott & Greis, Inc.

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A. R. Maas, Laboratories.
Smith-Emery Co.

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American Refractories Co.
Los Angeles Pressed Brick Co.
Stockton Fire Brick Co.
J. T. Thorpe & Son, Inc.

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J. N. J. Firebrick Co.

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Cutters, Pavement
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by Platen and Munters, two Swedish University students, and has been in successful operation in Europe for three or four years. The machine was originally designed for electric heat and has been perfected for use of gas by the Electrolux-Servel Corporation during the past year. Since securing the United States, Canadian and Cuban rights on the machine, this company has greatly improved it and materially increased the efficiency.

There are many decided advantages of this machine. Its first cost is comparatively low and it is very economical in operation. In Southern California, for example, the cost of gas for this machine will be from $1.00 to $1.50 per month and the cost of water for cooling is very nominal due to the small consumption, which ranges between four and eight gallons per hour. The machine maintains constant refrigeration without dependence on any mechanical means. Having no moving parts whatever, it is noiseless in operation. This is a feature of particular advantage for installation in apartment houses and residences. Every part of the machine is fixed and rigid and there is nothing to get out of order. The entire absence of mobile parts practically eliminates service.

CONSTRUCTION OF BOX

The refrigerator itself is of the highest quality; the cabinet is of pressed steel carefully lead-coated as a protection against rust. The steel shell is dipped twice in an oil base primer coat bath, and baked after each dipping at low temperatures so that both inside and outside will be thoroughly covered. This produces a surface which will neither scratch nor peel. The box after assembly is given several coats of white Duco, and allowed to air dry. The food capacity of the refrigerator is 6½ cubic feet and the cooling section inside of the box is of cast aluminum having five trays with a capacity of fifty (50) cubes. The box is insulated with three inches of high grade cork board thoroughly sealed with Hydrolene before being applied. The Thermo losses and operating costs are thereby reduced to a minimum. The box is full porcelain lined.

We know that the gas companies will make a decided success of selling this product, as they have other gas appliances. The companies that will sell the greatest number of these refrigerators to their consumers are the ones who make it easiest for their officials and employees to purchase these machines. An employee who has one of these wonderful devices in his home will most enthusiastically sell the idea to those with whom he comes in contact and as a result sales to consumers will be materially increased.

As described by Mr. Wyatt, ammonia, hydrogen and distilled water are employed as fluids of refrigeration. The apparatus works on the principle of refrigeration by absorption. That means that the refrigerating agent is carried through a part of the cycle by an absorption liquid. Ammonia, for instance, absorbed by water, is suitable as such an agent. The cycle of operation involves the releasing of the ammonia from the water by means of heat, after which the ammonia gas is liquefied by cooling it in a condenser. It is then made to evaporate at a low pressure and temperature in the evaporator, whereby heat is absorbed from the surroundings. This is the real cause of the production of cold. The gaseous ammonia is again absorbed by the water from which it was exuded; the solution is again heated, and the ammonia repeats its cycle. The introduction of hydrogen results in the elimination of all moving parts and for the first time refrigeration is produced without

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Pacific Meter Works.
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Gauges, Steam
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Semet-Solvay Engr. Corpn.
The Foxboro Co., Inc.
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Gauges, U Type
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Pacific Meter Works.
Safety Gas Main Stopper Co.
Semet-Solvay Engr. Corpn.
The Foxboro Co., Inc.
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Commercial Acetylene Co.

Generators, Water Gas
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Semet-Solvay Engr. Corpn.

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Hanger, Meter
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Potter Radiator Corporation.
Welsbach Company.
John Wood Mfg. Co.

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General Gas Light Co.
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Safety Gas Main Stopper Co.

Mains, Street
United States Cast Iron Pipe and Foundry Co.

Main, Stopper
Mueller Co.
Safety Gas Main Stopper Co.

Mantles, Gas Lighting
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Westcott & Greis, Inc.

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Pacific Meter Works.
Pittsburgh Meter Co.
The Foxboro Co., Inc.
Westcott & Greis, Inc.

Meters, Boiler
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Pittsburgh Meter Co.
The Foxboro Co., Inc.

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Pittsburgh Meter Co.
Sprague Meter Co.

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Pittsburgh Meter Co.
Sprague Meter Co.

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Sprague Meter Co.

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Pittsburgh Meter Co.

Meters, Consumers
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Pittsburgh Meter Co.
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Pittsburgh Meter Co.
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Pittsburgh Meter Co.
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Sprague Meter Co.
The Foxboro Co., Inc.

Meters, High Pressure Iron Case
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Pittsburgh Meter Co.
Sprague Meter Co.

Meters, Industrial Consumers
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Pittsburgh Meter Co.
Sprague Meter Co.
The Foxboro Co., Inc.

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Pittsburgh Meter Co.
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Pittsburgh Meter Co.
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Regulators, Hot Water Heat Control
Mueller Co.

mechanical means. The automatic temperature control, by means of a gas thermostat, will be a feature of the regular production of these machines from now on. By this means, the temperature of the food compartment can be accurately controlled within a few degrees.

Clean Oil Essential *to* Compressor Plants

(Continued from Page 27)

glass was graduated to one-tenth of a gallon scale. From the other 2-inch header a one-half inch drop line was run to the crank case of each unit and a stop cock was used to get the proper regulation of six gallons per hour to each unit.

From the crank case of each unit a DeLaval sight overflow was installed, the overflow being set at the proper crank case level. From the outlet of overflow we ran a graduated one and one-fourth inch line to a 4-inch header line. The 4-inch header line was installed in our pipe trench outside of the plant, the line being graded to a 250-gallon tank. From this run-down or dirty oil tank the oil is pumped by a three-fourths inch DeLaval direct connected motor pump (Pump No. 1) to a live steam heater where the oil is heated to 170 degrees F. From the heater tank the oil flows to the No. 600 DeLaval centrifuge, from the centrifuge to a balance tank where a second (No. 2) three-fourths inch rotary direct connected motor pump picks the oil up and puts it into the 500-gallon overhead storage for use in crank cases or lubricators. These pump units are operated by direct current motors, power for which is supplied from our generator which furnishes light for our plant.

New oil that is used each day is added to the dirty oil and is run through the heater and centrifuge to thoroughly mix the oil. Enough oil is used in lubricators in the plant operation to completely change the oil every 30 days; that is, over a period of 30 days we add the equivalent of the amount of oil used in the system.

The results from using a continuous system for cleaning the oil are highly satisfactory, insuring clean oil in all crank cases at all times. Formerly the best we could do was to change crank case oil at the rate of about one unit a day. Now oil is changed twice each day in all units in the plant.

Savings in crank case oil amount to about 50 per cent, and operating conditions in the plant have shown a marked improvement, especially noticeable in bearing adjustment. Moreover, where it formerly called for one and a half men's time continuously to take care of the oil, filling lubricators, changing crank case oil, cleaning crank cases, and so forth—now one man fills the lubricators, looks after the drips, runs the water softener, and does all of these duties properly.

Our net conclusion from our experience with the continuous cleaning system is all in favor of that method, as it saves oil, saves labor, saves machines, reduces operating costs, improves efficiency, and in addition is a much cleaner oil-handling method than others we have employed.

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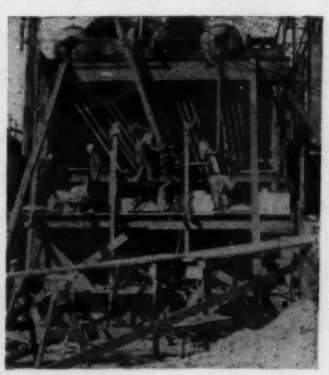

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L. R. Teeple Co.
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The C. & G. Cooper Co.

Valves, Gate
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Philadelphia Steel & Iron Co.
Semet-Solvay Engr. Corpn.

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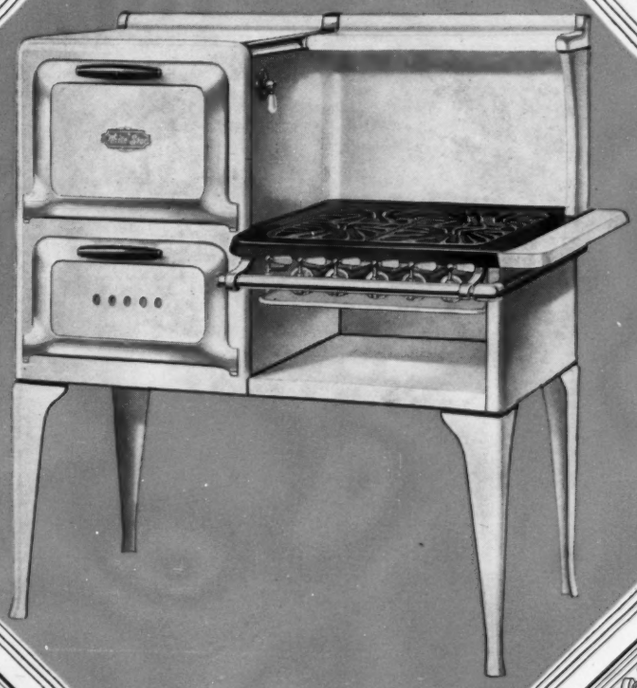

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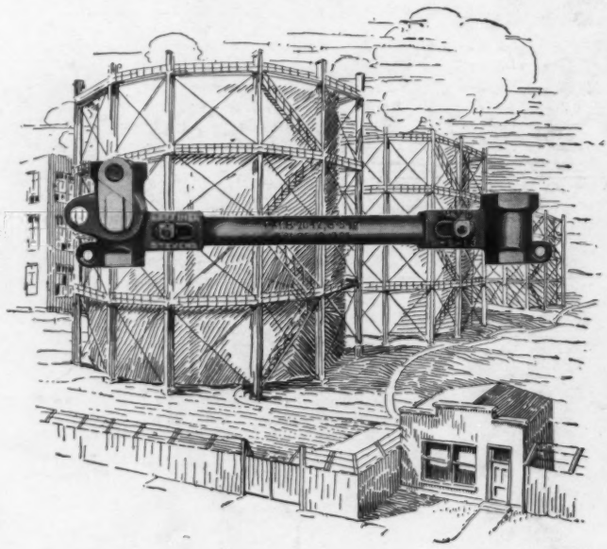
White Star
GAS RANGES



Little Leaks and Big Losses

One little leak in one meter may not be a serious loss to a gas company. But many small leaks may mean a loss of many hundreds of dollars in a few months.

Gas meters properly set with Lattimer-Stevens meter connections and shelves are protected against strains on columns and losses from washer shrinkage, thus conserving that important asset, good will between gas company and consumer.

Send for catalog and samples.

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Lattimer Stevens
METER CONNECTIONS-SHELVES
STOP COCKS AND SEALS